OWISoft

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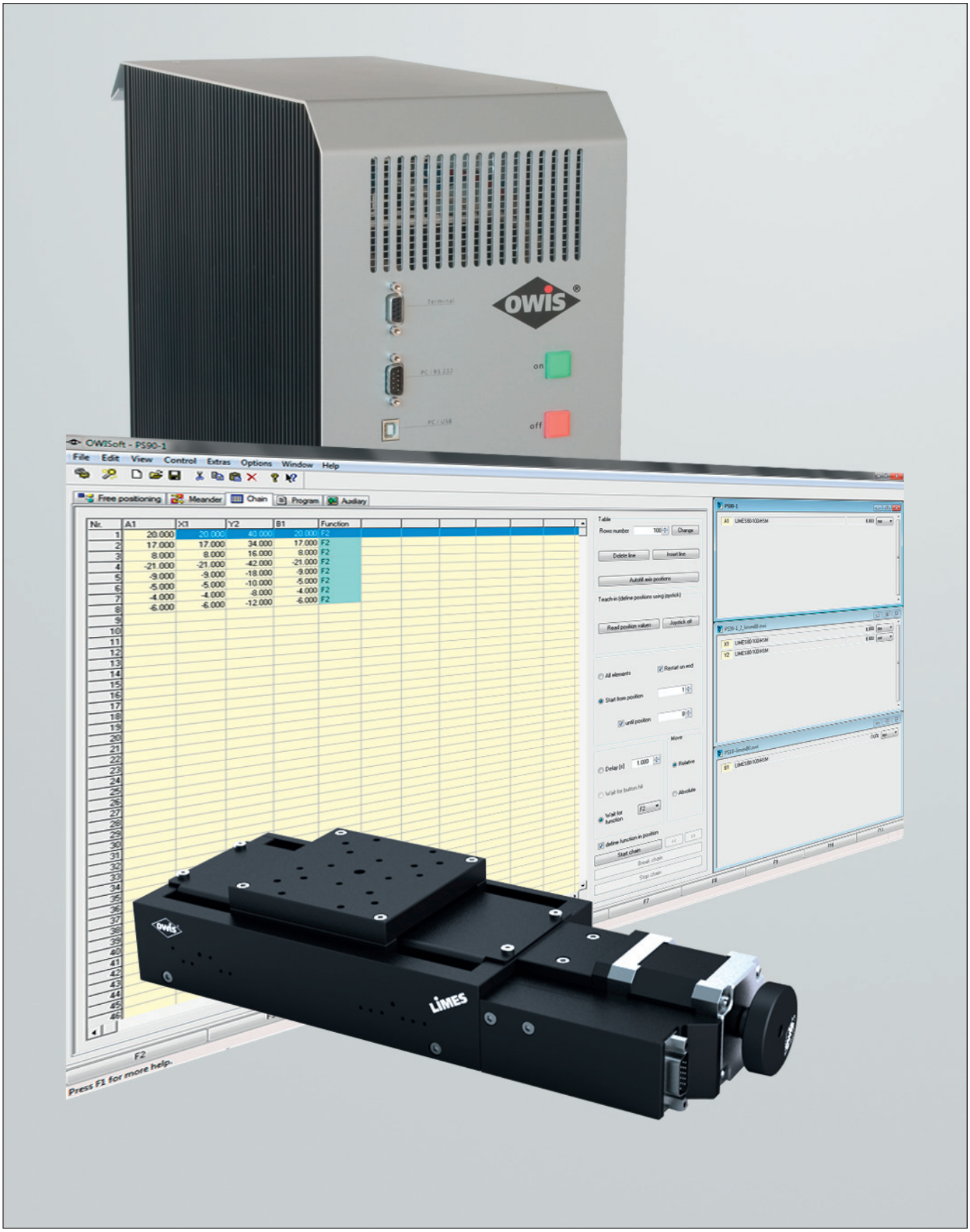

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OWISoft control software

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1 Introduction

1.1 OWISoft and its functions

This software has been developed to be used with the six control unit types of the OWIS GmbH: PS 90 (V 2.4 and higher), PS 30 (V 2.4 and higher), PS 10 (V 1.5 and higher), PS 35 (V 5.0 and higher), DC 500 (V 2.5 and higher) and SMS 60 (V 2.4 and higher).
It makes possible the operation of the above-mentioned OWIS® control units under the same user interface. It enables travel and storage of simple motion sequences (coordinate table), as well as periodic sequences (meander) and calibration. Using the program script you can extend the application or automate certain operational sequences. Path control (linear or circular interpolation) and dual position-control loop are possible with PS 90 (V 4.6 and higher), PS 30 (V 4.6 and higher) und PS 35 (V 5.0 and higher).

The software (32 bit) is written for Windows operating systems (Windows XP, Vista, Windows 7, Windows 8 and Windows 8.1). The program has been written and tested with a resolution of 1024x768 pixels in 24Bit color depth. For optimal operability of the graphic user interface we recommend to use these adjustments of the graphics card (or higher). The minimum hardware is a Pentium 233 MHz (or compatible), 512 MB RAM and 400 MB of free hard-disk space.

In order to be able to communicate with a control unit, the selected interface should already be installed and present in the system. For the control unit PS 90 this may be serial, USB or Ethernet interface. With the installation of the USB driver a virtual serial port is installed. The application software can access this USB interface in the same way as it would access a standard serial port (COM). The driver is available for Windows XP, Vista (32/64), Windows 7 (32/64), Windows 8 (32/64) and Windows 8.1 (32/64).
The PS 30 is a plug-in card (PCI bus). Therefore, the appropriate driver must be installed. With the installation of this driver a virtual serial port is installed. The application software can access this interface in the same way as it would access a standard serial port (COM). The driver is available for Windows XP, Vista (32/64), Windows 7 (32/64), Windows 8 (32/64) and Windows 8.1 (32/64).
For the control unit PS 10 this may be USB interface. With the installation of the USB driver a virtual serial port is installed. The application software can access this USB interface in the same way as it would access a standard serial port (COM). The driver is available for Windows XP, Vista (32/64), Windows 7 (32/64), Windows 8 (32/64) and Windows 8.1 (32/64).
For the control unit PS 35 this may be serial or USB interface. With the installation of the USB driver a virtual serial port is installed. The application software can access this USB interface in the same way as it would access a standard serial port (COM). The driver is available for Windows XP, Vista (32/64), Windows 7 (32/64), Windows 8 (32/64) and Windows 8.1 (32/64).
For the control units DC 500 and SMS 60 this may be the serial or the GPIB interface (the GPIB functions are based on the National Instruments drivers, therefore the GPIB communication is only possible through a NI GPIB board!).
Before the first start-up, you have to make sure that the interfaces and the drivers (for example, driver of the National Instruments, USB driver or PCI driver) are installed.

Additionally, you can use the “demo” control unit type for demonstration purposes (see chapter 3.1).

The program applies to one or more control units of the same or of different types. There are the following restrictions:

- Maximum number of axes which can be controlled is 12.
- Maximum number of controls of the same type is 10.
- Maximum number of control units is 12 (at least one axis per control unit).

The control is axis-based. That is, if the control units are connected (see chapter 3.1) and the axes defined, each axis is only called with its identifier everywhere in the program. The axis name has to be composed of alphanumeric characters and may consist of 3 characters maximum (“A1”, “x12”, etc.). In order to distinguish between several control units of the same type, the software generates a control unit index (for example, “PS90-1” is generated). With the control units PS 90, PS 30, PS 35, PS 10, DC 500 and SMS 60 this index will be defined through the order of their initialization (connection). The control unit first connected has the smaller index.

The software works with several parameters, which define the state and characteristics of an axis. The parameters which describe position and speed of the axis have the following measuring units (data type in brackets):

Position – Inc (long integer), mm (double), µm (double), deg (double), mrad (double);
Speed – Hz (double), mm/s (double), µm/s (double), deg/s (double), mrad/s (double).

For these two parameters you can define an output format to be used with each value output. When having double precision values, the format is determined by the decimal places specification (0-10). The format string is generated according to the pattern “11+1” (e.g. “%1.10f”, “%11f”). The other parameters do not have measuring units.

The parameters are stored in a configuration file with the extension “owi”. This file type is registered in the Windows registry as file type of the **OWISoft** application. Double-clicking such a file starts the program automatically and loads the selected file name as a parameter into the command line. The function “Drag & Drop” is activated. If application is opened, a file with the extension “owi” can be dragged from Windows Explorer into the application window.
The software works with three further file types: “owm”, “owc”, “owp”. These are text files, which store the configurations of the meander and the chain as well as the program script. You find further information in the sections describing these work areas.

The program supports several languages (German and English are available now). The **Options Sprache / Language…** menu item switches to the appropriate user interface. If no language is selected, the English interface is displayed.

1.2 MDI application

The program is a MDI application (MDI = Multiple Document Interface). The MDI specification requires a main frame for applications. It has a title bar including system menu and maximize/minimize buttons, a menu bar and a frame; the user can resize the application window with. Its application window is used not directly, but for displaying of any desired number of document views.

Document windows are quite similar to normal windows: They have a title bar with the usual four icons, a size changing frame, and scrollbars, possibly. There is no own menu bar: All functions are handled using the menu in the main frame.

You only have one of these document views active and in the foreground, this being indicated through an emphasized title bar. All document windows are cut off at the borders of the main frame, which determines the maximum size of each window; the system does not accept moving a document window beyond the borders of the main frame.

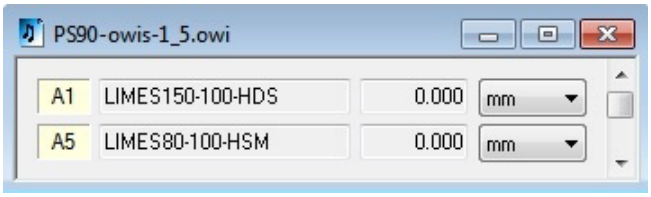
Specific features:

- Document windows can be reduced and are displayed as icon at the lower edge of the frame.
- If a document window is set on maximum size, its title bar disappears. This title bar usually displays the name of the respective document, which should appear in the title bar of the main frame together with the application name. The icon for the system menu of the document window is the first, the icon for enlarging or reducing the window the last point in the menu bar.
- If no document window is opened, you normally display only the menu items for the operations you need in order to open new windows.
- The main menu contains an option button “window”, which appears conventionally as the last one or left to the button “assistance” in the menu bar. The option buttons of the menu window enable activating of the document windows directly and their display as “overlapped”, “tile vertical” and “tile horizontal”.

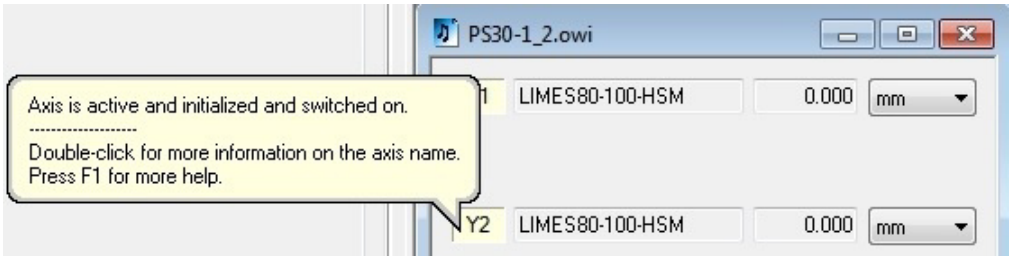
The MDI application has one (or several) document types. A view can be defined for each document. This is based on the Document-View architecture. The Document contains the application data, enables loading, saving and reading of data. The View contains the presentation of the data, enables correct displaying when data size changed and data updated.

The main frame is responsible for loading resources (menu, tool and status bar) and for loading pre-set values from the registry database.

The **OWISoft** software uses only one document type. For each control unit the program provides a document with an appropriate view. In the view the current positions for the defined axes of the control unit are displayed. The document manages the axis parameters and the values of the interface configuration. These data are stored in a configuration file of the type “owi”. If data have been changed, you can store them when leaving the application. The usual file operations are displayed in the menu bar (**File Control unit**). After the program start there is at first no control unit connected.



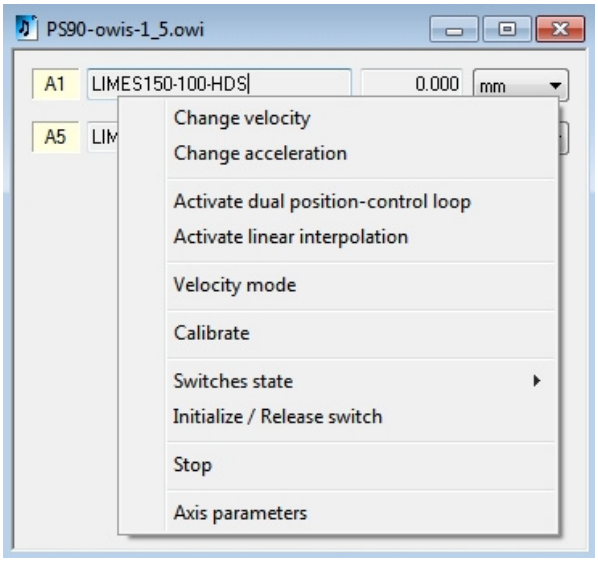
If the control unit is connected and the axis (axes) is (are) defined, then a view is displayed, in which the axis positions are indicated. The output for each axis consists of four elements: axis name, assigned positioning unit, current position, measuring unit. If no axis is still defined, then a tip “no axis selected” is displayed in the view. A double click on this tip displays the **Wizard for an axis configuration** dialog box for the selected control unit (the active window). An axis configuration is possible here step by step.



The function “Traffic light” (axis state indication) was extended (+ QuickInfo). When a user moves the mouse pointer over the axis name, a window that contains tooltip text (QuickInfo) appears for a specified amount of time. The background colour and the QuickInfo of the axis name (green, yellow, red + magenta) change according to the axis state: Green – axis is moving, Yellow – axis stands still and is ready to go, Red – axis stands still and is not ready to go (switched off, error etc.), Magenta – axis works in velocity mode with way measuring system (dual position-control loop, phase 3). The tooltip text describes the actual axis state.

A double click on the axis name displays the **Axis state** dialog box for the selected control unit (the active window). The according axis is selected.

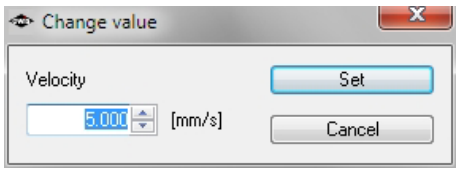
For the **Positioning unit** and **Position** text boxes the new pop-up menus are defined. Pop-up menus are menus specific for context that can be displayed when the user clicks the right mouse button over a control. The functions are executed for the according axis.



Positioning unit, functions of the pop-up menu

Change velocity - display and select velocity.

A click displays the **Change value** dialog box. The physical units for velocity and speed output data are identical. Here you can change the positioning velocity for the trapezoidal or S-curve profile (**Set** button).



Change acceleration - display and select acceleration.

A click displays the **Change value** dialog box. The physical units for acceleration and speed output data are identical (Hz – internal values). Here you can change the acceleration and deceleration values for the trapezoidal or S-curve profile (**Set** button).

Activate dual position-control loop – activate (checked) or deactivate dual position-control loop.

A dual position-control loop is possible only with a way measuring system which is connected to the second encoder input (Dual encoder). The axis goes to a new target position or a distance either in the trapezoidal or S-curve profile with dual position-control loop, if the hardware is available and the option is activated. The setting is valid for all work areas. If the function is not available with the selected control unit, it is grayed out.

Activate linear interpolation - activate (checked) or deactivate linear interpolation.

The axis goes to a new target position or a distance either in the trapezoidal or S-curve profile with linear interpolation, if the option is activated. If this option is activated with several axes of the same control unit, such axes go synchronically with linear interpolation. The setting is valid for all work areas. If the function is not available with the selected control unit, it is grayed out.

Please note that an axis goes to a new target position or a distance either with dual position-control loop or with linear interpolation or without both (standard positioning). If an option is activated, the other option is automatically deactivated. If none of the both is selected, the standard positioning is activated.

Velocity mode - start velocity mode.

A click displays the **Select speed for positioning** dialog box. The physical units for velocity and speed output data are identical. Here you can change the target velocity and start the velocity mode (**Set & start** button).

Calibrate - start reference run (calibration).

If the axis is not defined for calibration, this function does not have any effect for the axis (see **Calibration options** dialog box).

Switches state - display limit switch state (pop-up menu).

- **MINSTP** - limit switch MINSTP is active (checked).
- **MINDEC** - limit switch MINDEC is active (checked).
- **MAXDEC** - limit switch MAXDEC is active (checked).
- **MAXSTP** - limit switch MAXSTP is active (checked).

Initialize / Release switch - initialize axis, after that release active limit switches.

Stop - stop positioning.

Axis parameters - display and change axis parameters.

A click displays the **Define axis parameters for the control unit** dialog box. The according axis is selected. Here you can change and set the parameters individually or in groups (see **Axis parameters** dialog box).

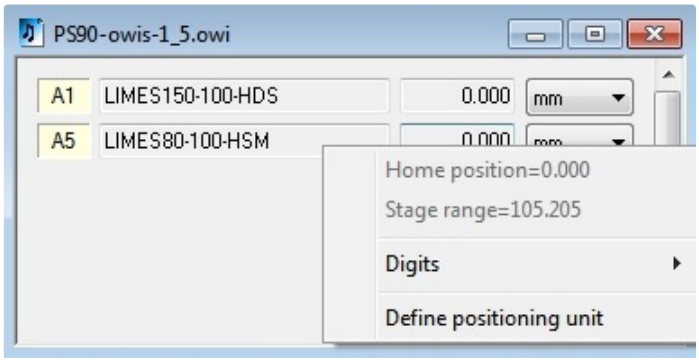
Position, functions of the pop-up menu

Home position - display value of home position.

The physical units for home position and position output data are identical. The home position is set in the **Free positioning** work area.

Stage range - display possible travel distance.

The physical units for travel and position output data are identical. The travel measurement can be executed in the **Free positioning** work area (available travel). Alternatively, one can take over this value from the program database (standard travel).

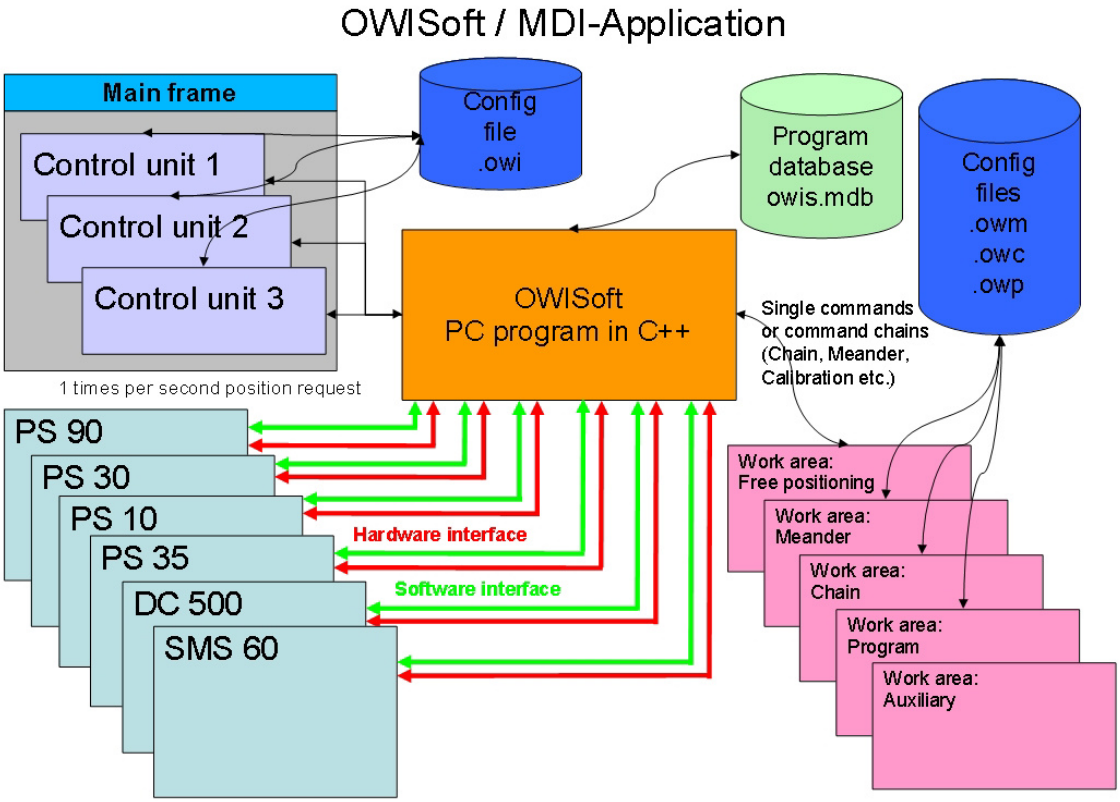


Digits - select number of decimal places (pop-up menu).
These values define position output data format, which is used for each value output (double values). The current setting is checked.

Define positioning unit - define positioning unit.
A click displays the **Define positioning unit** dialog box. The according axis is selected.

Combo box **Unit** - select measuring unit.
These values define position and speed output data format, which is used for each value output (see **Define positioning unit** dialog box).

The position value and axis state are updated continuously (once per second), and independently of the other program sections. **OWISoft** structure can be schematically shown as follows:



If the view is being closed, the control unit connection and the interface will be closed as well. The application prompts you to save configuration file for a control unit with unsaved changes.

2 User interface

2.1 Menu structure

2.1.1 File

Control unit

New

Keys **Ctrl+Alt+N**.
Displays the **Connect** dialog box for a new control unit.

Open

Keys **Ctrl+Alt+O**.
Opens an existing configuration file for a control unit and connects this control unit to the software (or displays the **Connect** dialog box).

Close

Closes the active window. The control unit connection and the interface will be closed. The application prompts you to save configuration file for a control unit with unsaved changes.

Save

Keys **Ctrl+Alt+S**.
Saves the selected configuration file to its current name and directory.

Save as

Saves and names the selected configuration file.

New

Keys **Ctrl+N**.
Opens a new configuration file for the selected work area (Meander, Chain or Program). Besides, the meander parameters are set to default. The table values of the chain definition are deleted. The program script is erased.

Open

Keys **Ctrl+O**.
Opens an existing configuration file for the selected work area (Meander, Chain or Program).

Save

Keys **Ctrl+S**.
Saves the configuration for the selected work area (Meander, Chain or Program).

Save as

Saves and names the configuration file for the selected work area (Meander, Chain or Program).

Export / import data

Saves or loads the data in CSV format for the selected work area (Chain).

Recent file

This command is only active if you have not yet opened an existing configuration file for a control unit. In this case the names of the last 6 configuration files opened will be listed here. Choose the number that corresponds with the file you want to open.

Exit

Ends your **OWISoft** session. The application prompts you to save configuration files for a control unit with unsaved changes.

2.1.2 Edit

Cut

Keys **Ctrl+X**.

Removes the currently selected data in a control of the selected work area (Chain – Table, Program – Editor) and puts it on the clipboard.

Copy

Keys **Ctrl+C**.

Copies selected data in a control of the selected work area (Chain – Table, Program – Editor) into the clipboard.

Paste

Keys **Ctrl+V**.

Removes selected data in a control of the selected work area (Chain – Table, Program – Editor) and inserts a copy of the clipboard contents at the insertion point.

Clear

Key **Del**

Removes selected data in a control of the selected work area (Chain – Table, Program – Editor).

2.1.3 View

Toolbars

Standard

Use this command to display and hide the standard toolbar. A check mark appears next to the menu item when the toolbar is displayed.

Encoder inputs

Use this command to display and hide the toolbar, in which the axis positions (Main encoder and Dual encoder) are indicated. A check mark appears next to the menu item when the toolbar is displayed.

Function keys

Use this command to display and hide the toolbar with the function keys. A check mark appears next to the menu item when the toolbar is displayed.

Status bar

Use this command to display and hide the status bar. A check mark appears next to the menu item when the status bar is displayed.

2.1.4 Control

Connect

Displays the **Connect** dialog box for the selected control unit (the active window).

CanOpen slaves

Displays the **Configuration of the CanOpen bus** dialog box for the selected control unit (the active window). If this command is grayed the networking with a CanOpen bus is not possible for the selected control unit.

Define axis

Displays the **Define axes** dialog box for the selected control unit (the active window).

Joystick configuration

Displays the **Joystick control** dialog box for the selected control unit (the active window). If this command is grayed the joystick option is not available for the selected control unit.

Info
Displays the **Info** dialog box for the selected control unit (the active window).

Define positioning unit
Displays the **Define positioning unit** dialog box for the selected control unit (the active window).

Justify power supply
Displays the **Justify power supply** dialog box for the selected control unit (the active window).

Axis parameters
Displays the **Define axis parameters for the control unit** dialog box for the selected control unit (the active window).

Axis state
Displays the **Axis state** dialog box for the selected control unit (the active window).

Inputs / Outputs
Displays the **Inputs and outputs** dialog box for the selected control unit (the active window). If this command is grayed the analog and digital inputs and outputs are not available for the selected control unit.

Keyboard
Activates or deactivates keyboard of the control unit. The keyboard is activated, if a check mark appears next to the command. If the command is grayed out, the selected control unit does not have a keyboard.

Protocol file (short)
Activates or deactivates the logging of the interface communication (short version, see chapter 3.12). The logging is activated, if there is a checkmark next to the command.

Protocol file (long)
Activates or deactivates the logging of the interface communication (long version, see chapter 3.12). The logging is activated, if there is a checkmark next to the command.

Protocol window
Displays the **Protocol** dialog box for the selected control unit (the active window).

Wizard mode
Displays the **Wizard for an axis configuration** dialog box for the selected control unit (the active window). An axis configuration is possible here step by step.

2.1.5 Extras

Continuous-path control (configuration)
Displays the **Continuous-path control** dialog box for the selected control unit (the active window).

Circular interpolation
Displays the **Calculate circular interpolation** dialog box for the selected control unit (the active window), in which you can create a configuration of the circular interpolation.

Start continuous-path control
Starts continuous-path control for the selected control unit (the active window).
Before you start a procedure, enter the range (start line / end line).

Stop continuous-path control
Stops a running continuous-path control for the selected control unit (the active window).

Dynamic error compensation
Displays the **Dynamic error compensation** dialog box.

2.1.6 Options

Sprache / Language
Deutsch
Switches to German user interface.
English
Switches to English user interface.

Database
Redefines the program database (file “owis.mdb”).

Plug-ins directory
Redefines a directory for program extensions (plug-ins).

Function keys
Displays the **Function keys** dialog box.

Help file
HLP
Switches to the help file (.hlp).
CHM
Switches to the help file (.chm).

2.1.7 Window

Cascade
Arranges windows in an overlapped fashion.

Tile horizontal
Arranges windows as non-overlapping tiles (horizontal).

Tile vertical
Arranges windows as non-overlapping tiles (vertical).

Arrange icons
Arranges icons of closed windows.

Window 1, 2 ...
Displays a list of currently open configuration files for a control unit at the bottom of the Window menu. A check mark appears in front of the file name of the selected control unit. Choose a file name from this list to make its window active and select a control unit.

2.1.8 Help

Help topics
Shows the directory of available help subjects (index of topics).

Info about OWISoft
Displays program information, version number and copyright.

2.2 Toolbar

The toolbar is displayed across the top of the application window, below the menu bar. The toolbar provides quick mouse access to many tools used in **OWISoft**.
To hide or display the Toolbar, choose **Toolbar** from the **View** menu.

Click	To

Menu command “File Control unit New”

Displays the **Connect** dialog box for a new control unit.

Menu command “Control Wizard mode”

Displays the **Wizard for an axis configuration** dialog box for the selected control unit (the active window). An axis configuration is possible here step by step.

Menu command “File New”

Opens a new configuration file for the selected work area (Meander, Chain or Program). Besides, the meander parameters are set to default. The table values of the chain definition are deleted. The program script is erased.

Menu command “File Open”

Opens an existing configuration file for the selected work area (Meander, Chain or Program).

Menu command “File Save”

Saves the configuration for the selected work area (Meander, Chain or Program).

Menu command “Edit Cut”

Removes the currently selected data in a control of the selected work area (Chain – Table, Program – Editor) and puts it on the clipboard.

Menu command “Edit Copy”

Copies selected data in a control of the selected work area (Chain – Table, Program – Editor) into the clipboard.

Menu command “Edit Paste”

Removes selected data in a control of the selected work area (Chain – Table, Program – Editor) and inserts a copy of the clipboard contents at the insertion point.

Menu command “Edit Clear”

Removes selected data in a control of the selected work area (Chain – Table, Program – Editor).

Menu command “Help Info about OWISoft”

Displays program information, version number and copyright.

OWISoft has extensive context-sensitive help.

If you do not understand a software function, an option or some other part of the software, simply click on the icon in the toolbar. The mouse pointer will change to the icon. Now click on the item which you would like help with.

You can also get help by pressing **F1**.

2.3 Status bar

The status bar is displayed at the bottom of the **OWISoft** window. To display or hide the status bar, use the **Status bar** command in the **View** menu.

The left area of the status bar describes actions of menu items as you use the arrow keys to navigate through menus. This area similarly shows messages that describe the actions of toolbar buttons as you depress them, before releasing them. If after viewing the description of the toolbar button command you wish not to execute the command, then release the mouse button while the pointer is off the toolbar button.

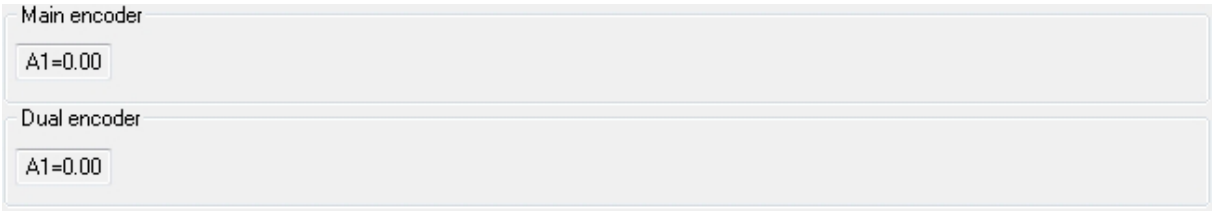
The right areas of the status bar indicate which of the following lock keys are turned on:

Indicator	**Description**
CAP	The Caps Lock key is turned on.
NUM	The Num Lock key is turned on.
SCRL	The Scroll Lock key is turned on.

2.4 Function keys

The function keys bar is displayed horizontally at the bottom of the application window above the status bar. It enables (by using the mouse or the keyboard - function keys **F2**...**F11**) quick access to the most common commands of **OWISoft** and the starting of external applications.
In order to customize the functions and the key labels, please open the **Function keys** dialog box (**Options Function keys** menu).

2.5 Encoder inputs

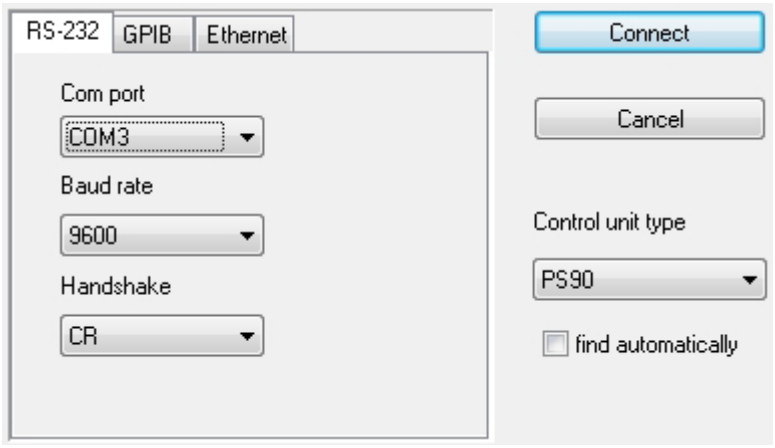


The bar with encoder inputs is displayed horizontally at the bottom of the application window above the status bar. In the bar the axis positions (Main encoder and Dual encoder) are indicated (up to 12 axes). The output for each axis consists of two elements: axis name and current position value. The position value is updated continuously (once per second).

3 Dialog boxes

3.1 Connect

The **Connect** dialog box enables to select (type of control unit) and to connect the desired control units.



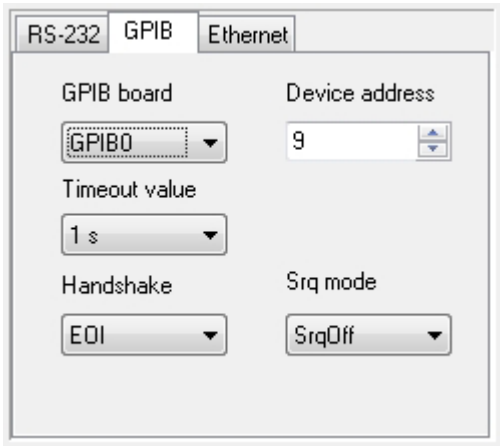
Combo box **Control unit type** - choose control unit type (demo, PS 90, PS 30, PS 10, PS 35, DC 500, SMS 60).
If you do not have any control unit, please select the type “demo”, in order to test the program.

You can use the “demo” control unit type for demonstration purposes. The processes (actions) are carried out only virtually, no commands will be transferred to any controller. The logging of the interface communication is not possible. The hardware-specific features (joystick, keyboard, limit switches) are deactivated. The string “demo” stands in the controls instead of the values read out by the control unit.
The approach with the “demo” control unit corresponds to the usual work flow in the application. First the interface is determined (the configuration can be chosen arbitrarily because no hardware is used). Then the desired axes will be defined (**Define axes** dialog box). To every axis one can assign a positioning unit (**Define positioning unit** dialog box). In this dialog one can take over the mechanical parameters from the program database, adapt and store them. The **Justify power supply** dialog box displays the motor power supply values. These values are loaded from the program database. One cannot store them. The parameters of the defined axes are displayed in the **Axis parameter** dialog box. Here one can take over them from the program database, adapt and store. The axis parameters can be combined to a profile (configuration) and saved as such in the program database. In the dialog box you can update or delete existing profiles and create new ones. If the parameter definition is completed, one can test the work areas of the application.
In the **Free positioning** work area the defined axes are selected for the absolute or relative positioning. Here one can change the settings for calibration and measuring of the available travel. The actions are carried out only virtually. No information is sent to the control unit.
In the **Meander** work area the defined axes can be determined as meander axes and be configured accordingly. The meander configuration can be stored and be loaded. One can handle the meander positions automatically or manually. The actions are carried out only virtually. No information is sent to the control unit.
In the **Chain** work area one can define a coordinate table and execute it. The coordinate table can be stored and be loaded. One can execute the chain positions automatically or manually. The actions are carried out only virtually. No information is sent to the control unit.
In the **Program** work area a small program script can be created to extend possibilities of the application and automate certain sequences. The script can be stored and be loaded. One can test the ready script and execute. The actions are carried out only virtually. No information is sent to the control unit.
The **Auxiliary** work area is inactive, there is no communication.
You find further information in the sections describing these work areas and dialog boxes.

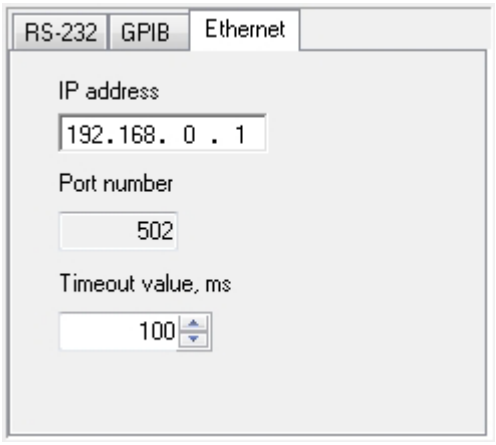
On the tabs (RS-232, GPIB, Ethernet) you can select the interface and adapt the settings, which are important for the communication, according to your needs.

RS-232
Combo box **Com port** - select serial interface (Com1, Com2 etc.).
Combo box **Baud rate** - select transfer rate, default: 9600 Baud.
Combo box **Handshake** - select handshake character, default: CR.

! Note: Before initializing the interface, please check the selected values. They should be identical to the control unit settings (control units DC 500 and SMS 60, mode 3, control unit PS 90, hand terminal "Setup/Serial Interface", see user manual).



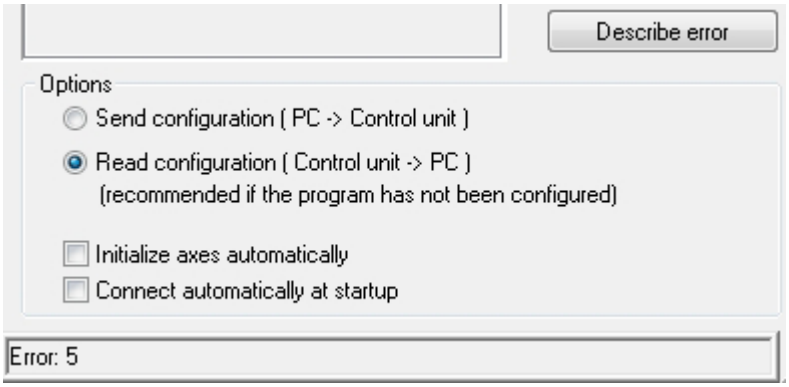
GPIB
Combo box **GPIB board** - select NI-GPIB-board (Gpib0 etc.).
Text box with spin button **Device address** - select address for the OWIS® control unit, default: 9.
Combo box **Timeout value** - select timeout value, default: 1 s.
Combo box **Handshake** - select handshake character, default: LF.
Combo box **Srq mode** - activate or deactivate SRQ mode.



Ethernet
Text box **IP address** - select network address for the OWIS® control unit, default value of the control unit: "0.0.0.0".
Text box **Port number** - select Modbus port, default: 502.
Text box with spin button **Timeout value** - select timeout value in ms, default: 100 ms.

! Note: One can configure the network interface with the following tools: "Anybus IPconfig" and "PS90 IPconfig" (..\OWISoft\Application\system). "Anybus IPconfig" defines the TCP/IP network settings of an Anybus module (Modbus/TCP). This utility has the ability to scan the Ethernet network for connected Anybus products (a control unit with Anybus module). Please note: the settings are lost after a reboot of the control unit. "PS90 IPconfig" defines the TCP/IP network settings of an Anybus module (Modbus/TCP). This utility needs an USB connection for the configuration. Please note: the settings are saved and available after a reboot of the control unit.

If the control unit is switched on and attached to a PC, you can test the selected interface configuration (**Connect** button). With the option (**find automatically** check box) one can search for the control unit (PS 90, PS 30, PS 10, PS 35) without parameter entry. If the control unit is connected, the message “Connection is OK” appears in the dialog status bar. Afterwards, the dialog box is closed. If the connecting attempt failed, the box will not be closed, and the message with the error code appears in the status bar. With the **Describe error** button the help file is loaded with the description of the error code. You also find this information in the appendix, page 84.


Describe error
Options
Send configuration (PC -> Control unit)
Read configuration (Control unit -> PC)
(recommended if the program has not been configured)
Initialize axes automatically
Connect automatically at startup
Error: 5

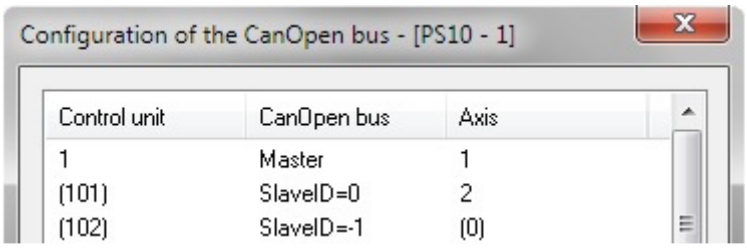
! Note: Before initial operation, please make sure that the interfaces are available and the drivers are installed.

In the **Options** group box you can define whether the control is to be automatically connected during the loading of the configuration file, and whether the control settings are to be sent to a control unit or read from a control unit, and whether the defined axes are initialized automatically.

Using the **Cancel** button you can close the dialog box any time.

3.2 Configuration of the CanOpen bus

This dialog box displays the configuration of the CanOpen bus for the selected control unit (the active window). Only for PS 10.



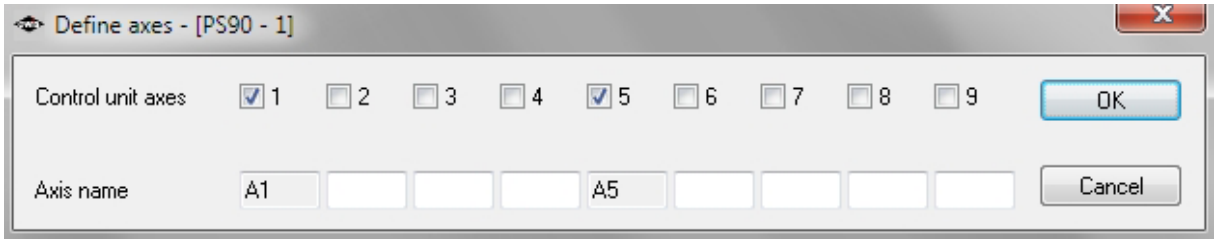
The application can be used with PS10 as well as with PS10-32. This is valid for single PS10(PS10-32) control unit (master) or for several PS10-32 units which are networked with a CanOpen bus (master + slaves).
The first PS10-32 is connected to a PC via USB (master), and all other units can be linked among each other via CanOpen bus (max. 31 slaves). The application provides up to 8 slave units. A communication is controlled by the master. Commands that are not intended for the master are sent on to the subsequent units. The reply of the slave control unit will be received by the master and returned via USB to a PC. The slave ID (parameter) should be set in the slave control unit for correct work of the CanOpen bus.
From several linked up PS10-32 the software makes a virtual control unit which has several axes and can access on the hardware of the single units. The axis assignment: axis1 belongs to master(1), axis2 – slave1(101), axis2 – slave2(102) etc.
The software needs an assigned bus address (slave ID) for every slave unit for the management. With the functions for single axes one can select it by the axis number or the control unit index. With the functions for the control unit (joystick, I/O) one can determine it by the control unit index.

Text box with spin button **Control unit** - select control unit.
Text box with spin button **Slave ID** - select slave ID.
Every slave unit needs an own slave ID (0-99). If the value is –1, the slave unit is deactivated.

With the **Set slave ID** button you can save the configuration.
With the **Close** button you can close the dialog box any time.

3.3 Define axes

Using the **Define axes** dialog box you can define and name the axis for the selected control unit (the active window).
In order to distinguish between several control units of the same type, the software generates a control unit index (for example, “PS90-1” is generated). This index will be defined through the order of the control unit initialization (connection). The control unit first connected has the lower index value.
Type of control unit and index are indicated in the title bar of the dialog box.



Check boxes **1** to **9** - activate or deactivate axis.
Text boxes **Axis name** - enter axis name.
The axis name has to be composed of alphanumeric characters and may consist of 3 characters maximum (“A1”, “x12” etc.). It is not possible to use the same name for two axes. The comparison takes place while activating the axes. An existing axis can be renamed here. Besides, the axis parameters are preserved.
Pressing the **OK** button you can activate the axes, save the axis definition and close the dialog box.

! With DC 500 and SMS 60 it is important to use only existing hardware axes, that have to be set active as well, otherwise malfunction may occur.
With PS 90, PS 30, PS 35 and PS 10 the axes released in the control unit can be activated.
The control mode of the software is axis-based. That means that after connecting of the control unit and defining of the axes, each axis is called only by its identifier everywhere in the program.

With the **Cancel** button you can close the dialog box any time. The axis definition is not changed.

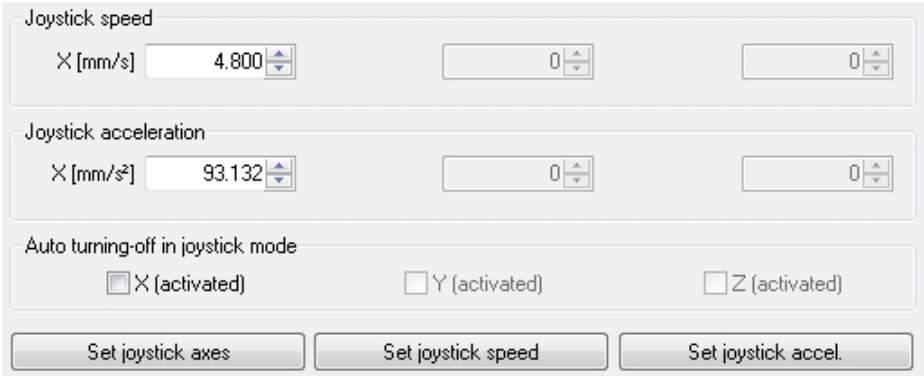
3.4 Joystick control

Using the **Joystick control** dialog box you can configure the joystick for the selected control unit (the active window), if this control unit can have a joystick (PS 90, PS 30, PS 35, PS 10, DC 500, SMS 60).
With PS 10 you can select whether a joystick configuration of the master or the slave unit is displayed.
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 3.3).

Radio buttons **Axis X** - select joystick axis X.
The axis X is always active with PS 10.
Radio buttons **Axis Y** - select joystick axis Y (only for PS 90, PS 30, PS 35, DC 500, SMS 60).

Radio buttons **Axis Z** - select joystick axis Z (only for PS 90, PS 30 and PS 35).
The radio buttons for the axes, which were not activated, are grayed out and do not have any name. The labels for the activated axes contain the axes names (see **Define axes** dialog box).

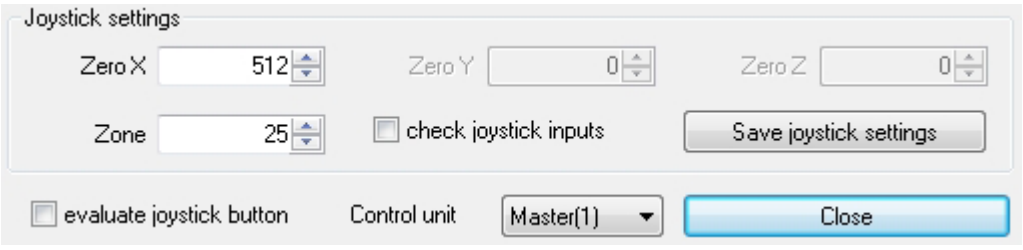
Pressing the **Set joystick axes** button you confirm the axes configuration.



Text boxes with spin button **Joystick speed** - select maximum speed of an axis for the joystick mode. The text box for the axis, which was not activated, is grayed out and has no name. The activated axes already have their names (X, Y, Z) consisting of measuring unit entry. The measuring units are defined in the Define positioning unit dialog box. Using the **Set joystick speed** button, you can save the new speed value. The sign defines the positioning direction of the joystick. If you would like to know more about the joystick speed, please see the manual for the corresponding control unit.

Text boxes with spin button **Joystick acceleration** - select acceleration of an axis for the joystick mode (only for PS 90, PS 30 and PS 35).
The text box for the axis, which was not activated, is grayed out and has no name. The activated axes already have their names (X, Y, Z) consisting of measuring unit entry. The measuring units are defined in the Define positioning unit dialog box. Using the **Set joystick accel** button you can save the new acceleration value.

Check box **Auto turning-off…** - activate or deactivate auto turning-off in joystick mode (only for PS 90).
An axis with dc motor will be switched off in joystick mode, if the joystick is in zero point (no joystick excursion). The joystick mode restarts by tilting the joystick.



Text box with spin button **X-Null** - select zero point of the joystick axis X (only for PS 90, PS 30, PS 35, PS 10).

Text box with spin button **Y-Null** - select zero point of the joystick axis Y (only for PS 90, PS 30, PS 35).
Text box with spin button **Z-Null** - select zero point of the joystick axis Z (only for PS 90, PS 30, PS 35).
Text box with spin button **Zone** - select inactive zone of the joystick (only for PS 90, PS 30, PS 35, PS 10).
Check box **…joystick inputs** - check analog inputs (1,2,3).
This option is used for the adjustment of the joystick zero points. If it is activated, the current values of analog inputs are displayed in the controls.
Pressing the **Save joystick settings** button you confirm the settings.
Check box **…joystick button** - activate or deactivate an evaluation of the joystick button (only for PS 90, PS 30, PS 35, PS 10).

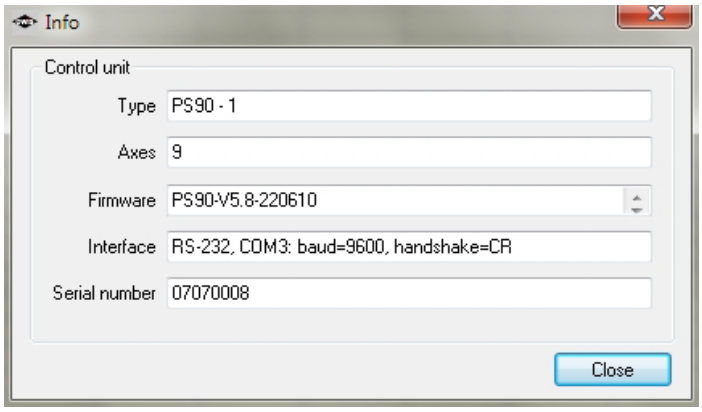
Combo box **Control unit** - select control unit (only for PS 10).
The axis assignment: axis1 belongs to master(1), axis2 – slave1(101), axis2 – slave2(102) etc. To work with the axes 2, 3…, the software needs an assigned bus address (slave ID) for suitable slave unit (menu “Control/CanOpen slaves”).

Press the **Close** button any time if you want to close the dialog box.

You cannot check whether a joystick is attached to the control unit or not. You can activate the joystick in the work areas “Free positioning”, “Chain”, “Meander” and “Program”.
Within the software, the joystick mode is activated or deactivated for all connected control units having a joystick connection at the same time. Herewith you may, for example, move to certain positions under optical control (for example, microscope). Such positions can be defined using the teach-in mode.

3.5 Info

The **Info** dialog box displays the control unit type, the axes number, the version string and the interface configuration for the selected control unit (the active window).



Text box **Type** - display control unit type and index (see chapter 3.3).
Text box **Axes** - display number of active control unit axes.
Text box **Firmware** - display firmware version.

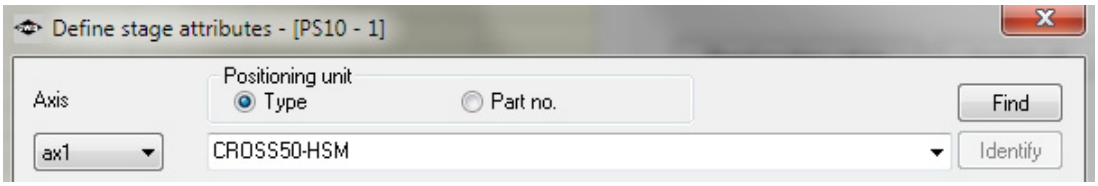
Text box **Interface** - display interface configuration.
The configuration is displayed as string. The individual parameters are separated through a comma. The first parameter is the interface type (RS-232, GPIB, TCP/Ethernet).

Control units PS 90, PS 30, PS 35, PS 10
Text box **Serial number** - display serial number of the control unit.
This data is specific for each control unit.
Control units DC 500, SMS 60
Text box **Keyboard** - display state of the control unit keyboard.
This data is specific for each control unit.

Press the **Close** button to close the dialog box anytime.

3.6 Define positioning unit

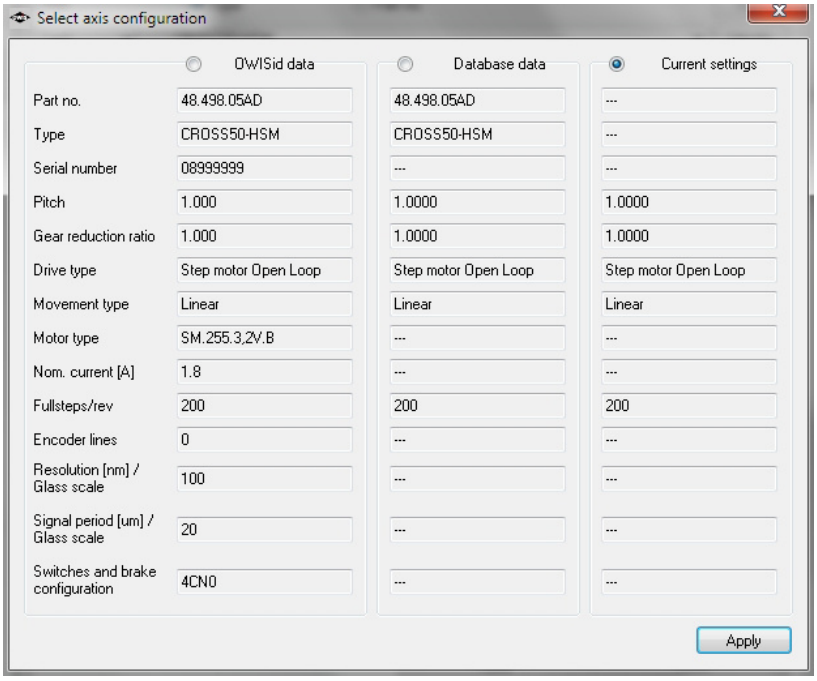
Define the positioning unit for the selected control unit (the active window) using this dialog box. Additionally, you can define an output format for position and speed values, which the application will be going to use for each value output, then.
For positioning units you can use different measurement systems. First of all increments (Inc), secondly - depending on the drive system: mm, µm or degrees (deg), mrad. In the first case, the values required are sent directly to the appropriate control unit (each control unit works internally with increments only, and does not know other units). In the second case, the values required are converted first into increments and sent then to the appropriate control unit. If you intend to position in mm, e.g., please define at first the mechanical parameters of the stage (they are used for internal calculation) for the appropriate axis. For simplification, the mechanical data (spindle pitch, gear reduction, number of encoder lines and number of full steps) are stored in a program database. If your stage is equipped with a linear measuring system, you can define its optical resolution.
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 3.3).



Combo box **Axis** - select axis identifier.
The parameters are specially defined for each control unit axis.

Combo box **Positioning unit** - select positioning unit.
In order to simplify the setting you can select a suitable positioning unit from the defined program database. To the search the type name (pre-setting) or the article number (part no.) can be used. After the string input the positioning unit can be selected in the list element of the combo box. The searching process can be also started with the **Find** button. After the selection the data saved in the database can any time be changed by means of following controls, if required or necessary. With the **Apply** button you can save the configuration for the selected axis (only with option “Type”).

Button **Identify** - identify OWISid chip, display data.
If the function is not available with the selected control unit or the corresponding hardware component was not found, the control is deactivated.


Select axis configuration
OWISid data
Database data
Current settings
Part no. 48.498.05AD 48.498.05AD ---
Type CROSS50-HSM CROSS50-HSM ---
Serial number 08999999 --- ---
Pitch 1.000 1.0000 1.0000
Gear reduction ratio 1.000 1.0000 1.0000
Drive type Step motor Open Loop Step motor Open Loop Step motor Open Loop
Movement type Linear Linear Linear
Motor type SM.255.3,2V.B --- ---
Nom. current [A] 1.8 --- ---
Fullsteps/rev 200 200 200
Encoder lines 0 --- ---
Resolution [nm] / Glass scale 100 --- ---
Signal period [um] / Glass scale 20 --- ---
Switches and brake configuration 4CN0 --- ---
Apply

In order to simplify the setting you can identify a positioning unit which is equipped with an OWISid chip (hardware). After the successful recognition a dialog is displayed.

The following data are displayed: OWISid data, the corresponding configuration from the program database and current settings. The desired configuration is selected with radio buttons (OWISid – as data source; database – as data source; keep current settings). With the **Apply** button you can close the dialog box.
The selected data can any time be changed by means of following controls, if required or necessary. With the **Apply** button you can save the configuration for the selected axis (only with option “Type”).

Combo box **Drive type** - select type of drive (only for PS 90, PS 30, PS 35, PS 10).
Here one determines whether the axis is controlled in the Closed-Loop mode (DC-Brush, BLDC, Stepper-Closed-Loop) or in the Open-Loop mode. For the control unit PS 30 or PS 35 only three types are possible: DC-Brush, Stepper-Open-Loop and Stepper-Closed-Loop. For the control unit PS 10 only two types are possible: DC-Brush and Stepper-Open-Loop. The drive type is defined by OWIS GmbH. It is adjusted for an according hardware configuration.

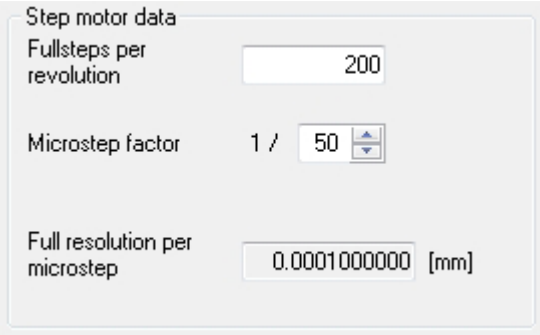
Combo box **Movement type** - select type of movement.
For the positioning unit assumed from the database the drive type and the movement type are predefined. One cannot change them. The controls are grayed out.

The **Stage attributes** section defines mechanical parameters.

Text box **Pitch** - select spindle pitch.
In the program database the values for the pitch are stored in m (for linear measuring stages) or in degrees (for rotary measuring stages). If these values are loaded, they are converted according to the definition of the measuring unit for the output (default: mm – for linear stages, deg – for rotary stages).

Text box **Gear reduction ratio** - select gear reduction.
The data are mechanical parameters and valid for all control unit types.

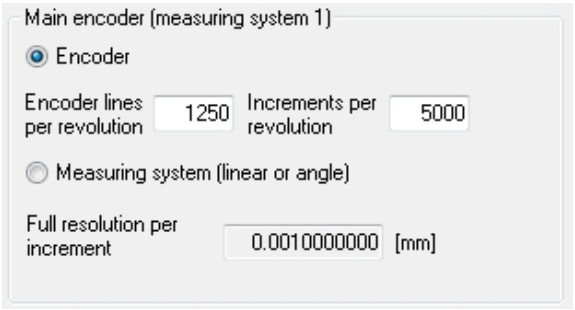
The **Step motor data** section defines parameters of the step motors.



Text box **Fullsteps per revolution** - select number of fullsteps per revolution.
Text box **Microstep factor** - select number of microsteps per fullstep.

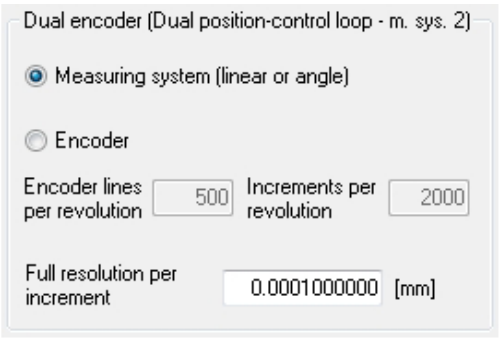
Text box **Full resolution...** - display calculated resolution per microstep.
These data are drive-specific and apply only to control unit types, which can control step motors (PS 90, PS 30, PS 35, PS 10, SMS 60). The physical units for resolution and position output data are identical.

The **Main encoder** section defines the first measuring system used. This measuring system is available for the axes in the Closed-Loop mode. Only one measuring system can be activated: **Encoder** and **Measuring system (linear or angle)** radio buttons. The appropriate controls are activated and the others are deactivated.

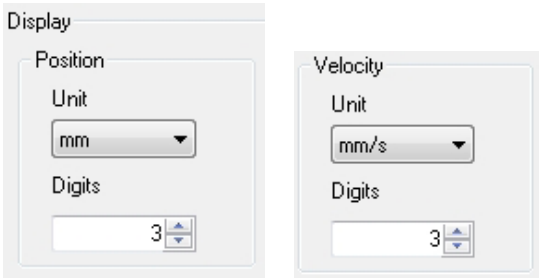


Text box **Encoder lines…** - select number of encoder lines.
Text box **Increments per revolution** - display number of increments per revolution.
Text box **Full resolution...** - display calculated resolution per increment.
These data describe the selected measuring system. If a measuring system is not applicable with the selected control unit, the corresponding radio button is grayed out. The physical units for resolution and position output data are identical.

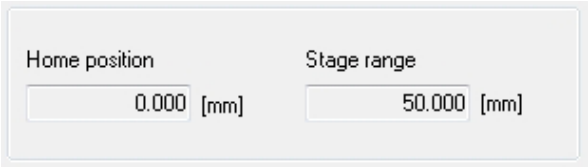
The **Dual encoder** section defines the second measuring system used. This is optional equipment, and can be used with all axes for dual position-control loop (PS 90, PS 30). Only one measuring system can be activated: **Measuring system (linear or angle)** and **Encoder** radio buttons. The appropriate controls are activated and the others are deactivated. One can take over the parameters for dual position-control loop from the program database (e.g., “LIMES80-100-HSM, LMS 0.1”).



Text box **Encoder lines…** - select number of encoder lines per revolution.
Text box **Increments per revolution** - display number of increments per revolution.
Text box **Full resolution...** - display calculated resolution per increment.
These data describe the selected measuring system. If a measuring system is not applicable with the selected control unit, the corresponding radio button is grayed out. The physical units for resolution and position output data are identical.



Combo box **Unit** - select measuring unit.
Text box with spin button **Digits** - select number of decimal places.
These values define position and speed output data format, which is used for each value output. The following measuring units (data type in brackets) are possible:
Position – Inc (long integer), mm (double), µm (double), deg (double), mrad (double);
Speed – Hz (double), mm/s (double), µm/s (double), deg/s (double), mrad/s (double).
The decimal places (0 – 10) determine the output format for the double precision values. The format string is generated according to following scheme “11+1” (e.g. “%1.10f”, “%11f”). The acceleration values are used the speed output data format. An exception is the setting “Hz”. In this case the internal values are used as measuring unit.



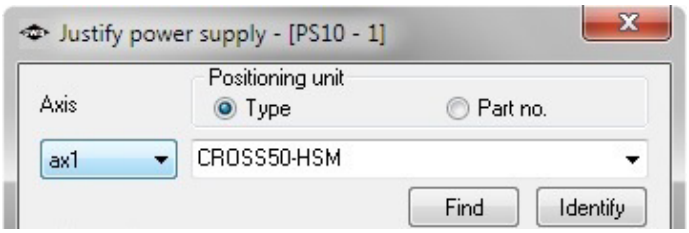
Text box **Home position** - display value of home position.
Text box **Stage range** - display possible travel distance.
The home position is set in the **Free positioning** work area. The travel range is loaded from the program database or is measured. A travel measurement (**Free positioning** work area) is only possible with linear or rotary stages, which are equipped with limit switches at both ends or with a single switch (rotary stage). For rotary stages (only for DC 500, SMS 60), the possible travel range is supposed to be a fix percentage (97 %) of the defined pitch value (default value: 360 degrees, according to a complete turn of the rotary stage). The measuring unit for home position and travel is identical to the one of the position outputs.
Use the **Apply** button in order to set the parameters for the selected axis (only with option “Type”). Press the **Close** button any time if you want to close the dialog box.

Stage data / Program database
Axis identifiers, all the parameters which are defined in the dialog box, and types of the corresponding positioning unit are stored in the special configuration file with the extension “owi” for each control unit. In the program database, only the mechanical data are supplied. The output format is not stored there. If you do not know which data apply to your positioning units, please select the units “Inc” for the position outputs and "Hz" for the speed outputs. In this case the remaining mechanical data, for example, pitch, will not be considered.

! Should you not find the type designation of your positioning unit in the **Positioning unit** combo box, because it concerns a customized product, we recommend to select a similar positioning unit as basic adjustment and to change the corresponding parameters manually afterwards.

3.7 Justify power supply

The **Define power supply** dialog box displays the motor power supply for the selected control unit (the active window).
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 3.3).

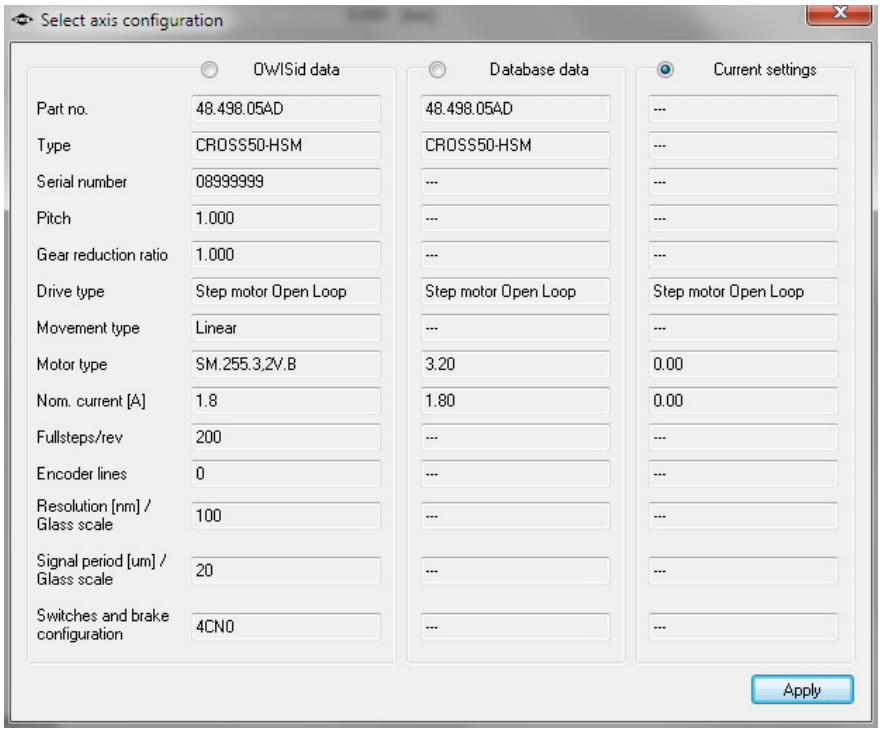


Combo box **Axis** - select axis identifier.
The power supply is defined for each control unit axis.

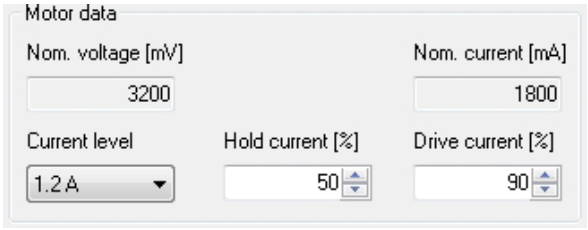
Combo box **Positioning unit** - select positioning unit.
In order to simplify the setting you can select a suitable positioning unit from the defined program database. To the search the type name (pre-setting) or the article number (part no.) can be used. After the string input the positioning unit can be selected in the list element of the combo box. The searching process can be also started with the **Find** button. After the selection the data saved in the database can be changed by means of following controls any time, if required or necessary. If the selected control unit does not have this function, the corresponding control is grayed or faded out. With the **Set** button you can save the configuration for the selected axis.

Button **Identify** - identify OWISid chip, display data.
If the function is not available with the selected control unit or the corresponding hardware component was not found, the control is deactivated.

In order to simplify the setting you can identify a positioning unit which is equipped with an OWISid chip (hardware). After the successful recognition a dialog is displayed.


Select axis configuration
OWISid data
Database data
Current settings
Part no. 48.498.05AD 48.498.05AD ---
Type CROSS50-HSM CROSS50-HSM ---
Serial number 08999999 --- ---
Pitch 1.000 --- ---
Gear reduction ratio 1.000 --- ---
Drive type Step motor Open Loop Step motor Open Loop Step motor Open Loop
Movement type Linear --- ---
Motor type SM.255.3,2V.B 3.20 0.00
Nom. current [A] 1.8 1.80 0.00
Fullsteps/rev 200 --- ---
Encoder lines 0 --- ---
Resolution [nm] / Glass scale 100 --- ---
Signal period [um] / Glass scale 20 --- ---
Switches and brake configuration 4CN0 --- ---
Apply

The following data are displayed: OWISid data, the corresponding configuration from the program database and current settings. The desired configuration is selected with radio buttons (OWISid – as data source; database – as data source; keep current settings). With the **Apply** button you can close the dialog box.
The selected data can any time be changed by means of following controls, if required or necessary. With the **Set** button you can save the configuration for the selected axis.



Text box **Nom. voltage** - display value of the nominal voltage in mV.

Text box **Nom. current** - display value of the nominal current in mA.

Combo box **Current level** - select maximum current of a power amplifier (only for PS 90, PS 30, PS 35 and PS 10).

This data is specific for each control unit.
Control unit PS 90
For step motor axes (Open Loop) it is a maximum adjustable current (low – 2.4A, high – 5.45A). For dc servo motor axes (DC-Brush) the maximum current limiting is defined (12A). For BLDC and step motor axes (Closed-Loop) the maximum current limiting is defined (6A).
Control units PS 30, PS 35
For step motor axes (Open Loop) it is a maximum adjustable current (low – 1.2A, high – 3.3A). For dc servo motor axes (DC-Brush) it is a maximum current limiting (low – 2.4A, high – 6.6A). For step motor axes (Closed-Loop) it is a maximum current limiting (low – 1.2A, high – 3.3A). The actual current limiting is defined in the hardware.
Control unit PS 10
For step motor axes it is a maximum adjustable current (low – 1.2A, high – 3.3A). For dc servo motor axes it is a maximum current limiting (low – 2.4A, high – 6.6A).

Text box with spin button **Hold current** - select value for the hold current (only for PS 90, PS 30, PS 35, PS 10, SMS 60: in percent of maximum current).
These values are valid only for the step motor axes (Open Loop).

Text box with spin button **Drive current** - select value for the drive current (only for PS 90, PS 30, PS 35, PS 10: in percent of maximum current).
These values are valid for the step motor axes (Open Loop). With the control unit PS 10 a current limiting can be defined with this value for dc servo motor axes. With the control unit PS 90 a current limiting can be defined with this value for the axes in the Closed-Loop mode (DC-Brush, BLDC, Stepper-Closed-Loop).

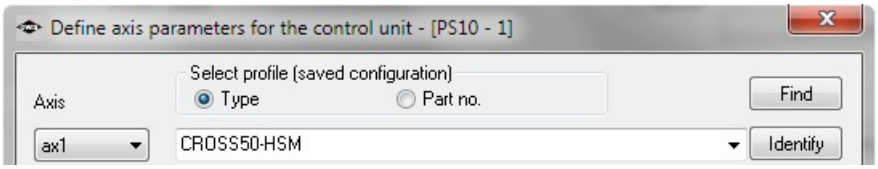
Use the **Set** button in order to set the current values for the selected axis.

Use the **Motor**... button to switch the power supply on or off for the selected axis. This button operates like a check box. The button state and the heading indicate whether the motor is switched on or off.
With the control units PS 90, PS 30, PS 35 and PS 10 the appropriate axis is completely initialized and afterwards is switched on.

With the **Close** button you can close the dialog box any time.
All selected parameters as well as all axis identifiers are saved in a separate configuration file with the extension “owi” for each control unit.

3.8 Axis parameters

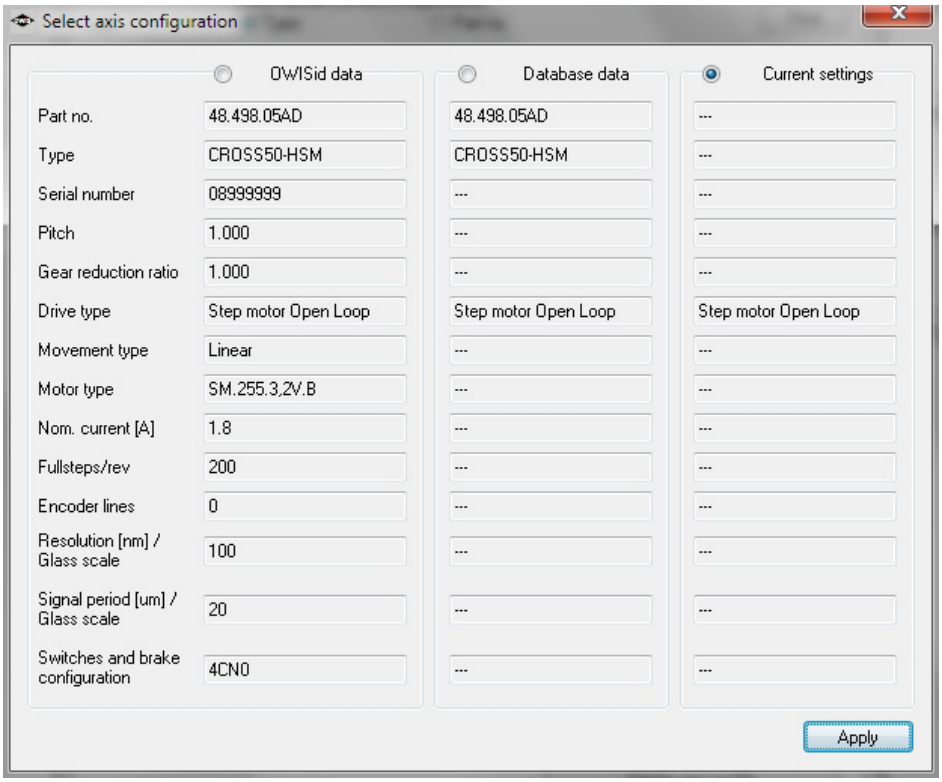
In this dialog box the specific axis parameters are displayed for the selected control unit (the active window), such as limit switch configurations, positioning speeds and acceleration values, as well as PID feedback control loop parameters or special parameters of the control unit (only for PS 90, PS 30, PS 35 and PS 10). They will be read out from the control unit. Here you can change and set these parameters, if necessary. The axis parameters can be combined to a profile (configuration) and saved as such in the program database. In the dialog box you can update or delete existing profiles and create new ones. All changes are automatically transferred to the database.
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 3.3).



Combo box **Axis** - select axis identifier.
The parameters will be separately defined for each control unit axis. After the selection the parameters are indicated for the suitable axis (controls are updated).

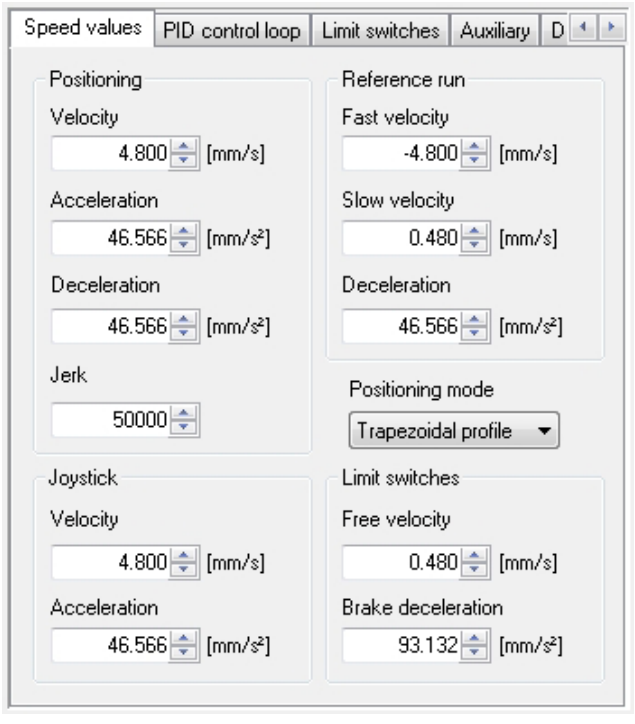
Combo box **Select profile** - select profile.
In order to simplify the setting you can select a suitable profile (positioning unit) from the defined program database. To the search the type name (pre-setting) or the article number (part no.) can be used. After the string input the positioning unit (profile) can be selected in the list element of the combo box. The searching process can be also started with the **Find** button. After the selection the data saved in the database can be changed by means of following controls any time, if required or necessary. The parameters are divided into six groups. On the tabs (Speed values, PID control loop, Limit switches, Auxiliary, Dual position-control loop, Linear interpolation) you can select the parameter group and adapt the settings. If the selected control unit does not have this function, the corresponding control is grayed out. With the **Set one parameter** button or **Set all parameters** button you can save the parameters for the selected axis. This is valid only for the selected tab.

Button **Identify** - identify OWISid chip, display data.
If the function is not available with the selected control unit or the corresponding hardware component was not found, the control is deactivated.
In order to simplify the setting you can identify a positioning unit which is equipped with an OWISid chip (hardware). After the successful recognition a dialog is displayed.



The following data are displayed: OWISid data, the corresponding configuration from the program database and current settings. The desired configuration is selected with radio buttons (OWISid – as data source; database – as data source; keep current settings). With the **Apply** button you can close the dialog box.
The selected data can any time be changed by means of following controls, if required or necessary. With the **Set one parameter** button or **Set all parameters** button you can save the parameters for the selected axis. This is valid only for the selected tab.

In the following section (Tab “Speed values”) the parameters for velocity and acceleration for the selected axis are indicated. They can be changed also. This data is specific for each control unit. If the function is not available with the selected control unit, the corresponding control is deactivated.



Positioning

Text box with spin button **Velocity** - display and select velocity.
The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. All parameters for velocity in the selected tab are read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.

Text box with spin button **Acceleration** - display and select acceleration.
The physical units for acceleration and speed output data are identical (Hz – internal values).
Text box with spin button **Deceleration** - display and select deceleration (only for PS 90, PS 30, PS 35).
The physical units for deceleration and speed output data are identical (Hz – internal values).
Text box with spin button **Jerk** - display and select maximum jerk for S-curve profile (only for PS 90, PS 30, PS 35).

Reference run

Text box with spin button **Fast velocity** - display and select fast velocity for reference run (limit switch approach velocity).
Text box with spin button **Slow velocity** - display and select slow velocity for reference run (limit switch release velocity).
With the control units PS 90, PS 30, PS 35 and PS 10 the sign defines the positioning direction. The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. All parameters for velocity in the selected tab are read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.

Text box with spin button **Deceleration** - display and select deceleration for reference run (only for PS 90, PS 30, PS 35, PS 10).
The physical units for deceleration and speed output data are identical (Hz – internal values).

! Note: A counterclockwise motor rotation at plan view to the second shaft end, or a slide motion of a linear measuring stage away from the motor is defined as positive direction.

Combo box **Positioning mode** - select positioning mode (only for PS 90, PS 30, PS 35).
The setting determines whether an axis goes in the trapezoidal or S-curve profile.

Joystick

Text box with spin button **Velocity** - display and select maximum velocity for joystick mode (only for PS 90, PS 30, PS 35, PS 10).
With the control units PS 90, PS 30, PS 35 and PS 10 the sign defines the positioning direction. The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. All parameters for velocity in the selected tab are read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.
Text box with spin button **Acceleration** - display and select acceleration for joystick mode (only for PS 90, PS 30, PS 35).
The physical units for acceleration and speed output data are identical (Hz – internal values).

Limit switches

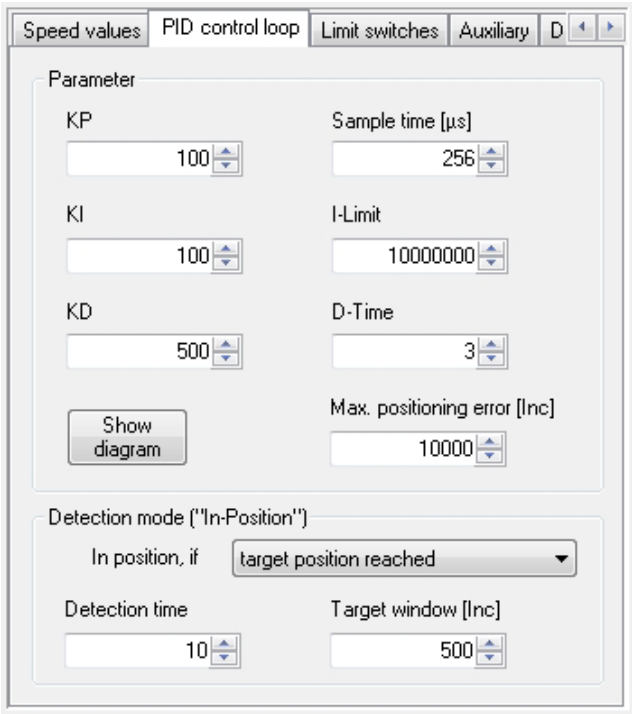
Text box with spin button **Free velocity** - display and select velocity for limit switch release.
The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. All parameters for velocity in the selected tab are read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.
Text box with spin button **Brake deceleration** - display and select deceleration for brake switches (only for PS 90, PS 30, PS 35).
The physical units for deceleration and speed output data are identical (Hz – internal values).

With the **Set one parameter** button you can save the last changed parameter for the selected axis. This is valid only for the selected tab.
With the **Set all parameters** button you save all parameters for the selected axis. This is valid only for the selected tab.

In the following section (Tab “PID control loop”) the parameters of the PID control loop for the selected axis are indicated. They can be changed also. The PID control loop data refer to the control units PS 90, PS 30, PS 35, PS 10 and DC 500 (Closed-Loop mode). With the control unit PS 90 PID power control can be defined for the step motor axes (Open-Loop). For other control units the corresponding controls are deactivated.

Parameter

Text box with spin button **KP** - display and select proportional term of PID control loop.
Text box with spin button **KI** - display and select integral term of PID control loop.
Text box with spin button **KD** - display and select differential term of PID control loop.
Text box with spin button **Sample time** - display and select sample time in microseconds.
Text box with spin button **I-Limit** - display and select integral term limitation.
Text box with spin button **D-Time** - display and select time of the D parameter in sample time cycles.
Text box with spin button **Max. positioning error** - display and select maximum position error in increments (only for PS 90, PS 30, PS 35, PS 10).



PID power control (PS 90, Stepper-Open-Loop)

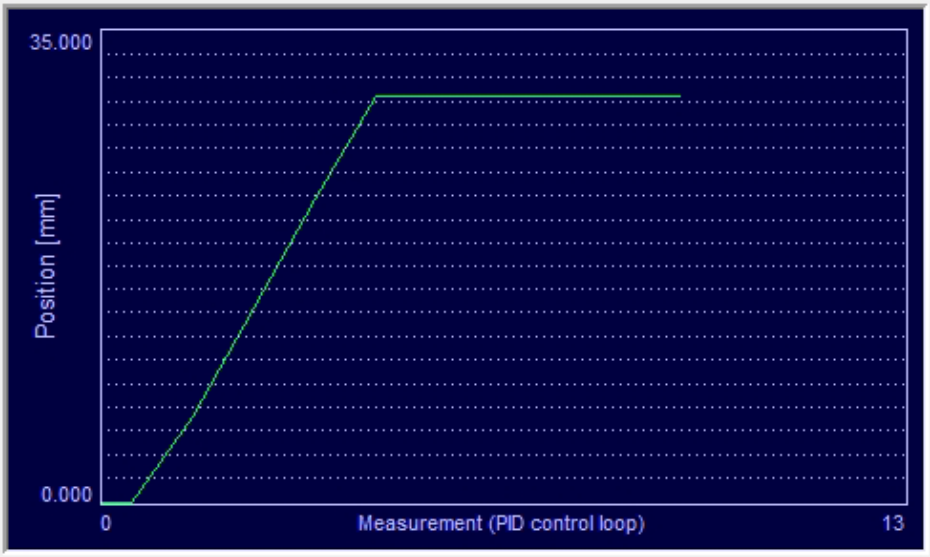
Text box with spin button **KP** - display and select proportional term of power control loop.
Text box with spin button **KI, fast drive** - display and select integral term of power control loop, fast drive.
Text box with spin button **KI, slow drive** - display and select integral term of power control loop, slow drive.
Text box with spin button **KD** - display and select differential term of power control loop.

Detection mode

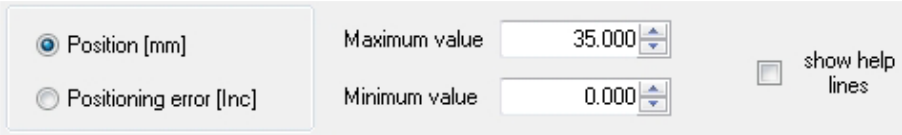
Combo box **Detection mode** - select detection mode.
This setting determines when an axis positioning is finished.
Text box with spin button **Detection time** - display and select detection time of an axis for movement end (values in sample time cycles).
This setting determines when an axis positioning is finished.
Text box with spin button **Target window** - display and select target window of an axis for movement end (values in encoder counts).
This setting determines when an axis positioning is finished.
These data refer to the control units PS 90, PS 30, PS 35 (Closed-Loop mode). For other control units, corresponding controls are deactivated.

With the **Set one parameter** button you can save the last changed parameter for the selected axis. This is valid only for the selected tab.
With the **Set all parameters** button you can save all parameters for the selected axis. This is valid only for the selected tab.

With the **Show diagram** button you can display diagram window. You can test the parameters of PID control loop by means of short-distance run. Please select a certain distance and start a test run. During the test run current position values and current position error are stored in a program list. The stored data are shown in the diagram window graphically. After the renewed short-distance run or reference run the stored data are cleared.



The X axis of the diagram is the measuring points (0 to N). If not all points of the measurement can be shown in the diagram, only last measured points are indicated (X to N). The number of the representable measuring points can be changed with the scale for the X axis (X scale). The Y axis of the diagram is the measured position values or the measured position error.



Radio buttons **Position**... - select values for the Y axis.
The measuring unit of the position is the same as for the position output for the assigned axis. The values of the position error are displayed in increments.
Text box with spin button **Maximum value** - select maximum value of the Y axis.
With representation of the position error the scale of the Y axis can be changed with this value.
Text box with spin button **Minimum value** - select minimum value of the Y axis.

Check box **show help lines** - display and hide help lines of the diagram.
With representation of the position values these are two horizontal and one vertical line: start position, target position and the measuring point in which of the positioning was finished. After it the readjustment is active.
With representation of the position error this is one vertical line: the measuring point in which of the positioning was finished. After it the readjustment is active.

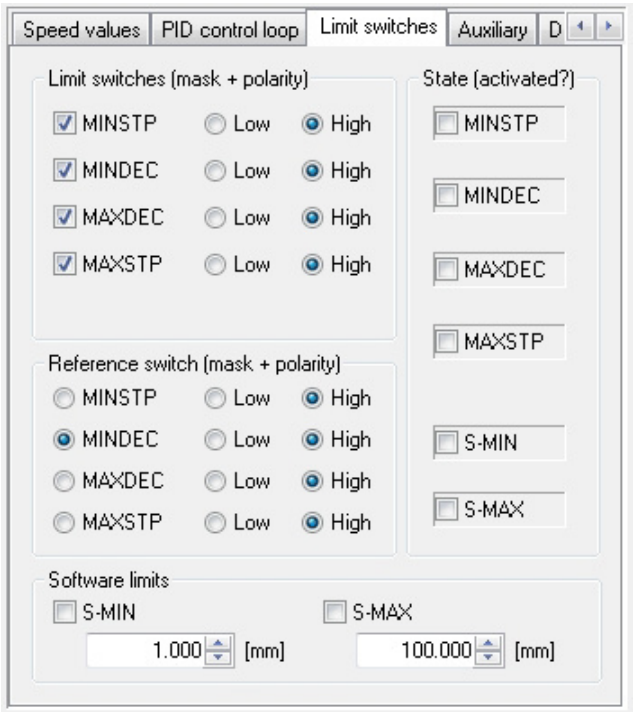
Radio buttons **x 1, x 2, x 4, x 8** - select scale of the X axis.
With it the number of the representable measuring points is reduced or raised.
With the **Update** button you can display the diagram once more. After every change of the configuration this button should be clicked to update the representation.
With the **Export data** button the diagram data can be saved into a text file (..\data\pid_data_export.txt).
With the **Close** button you can close the dialog box any time.

In the following section (Tab "Limit switches") the limit switch configuration for the selected axis is indicated. It can be changed also. This data is specific for each control unit. If the function is not available with the selected control unit, the corresponding control is grayed or faded out. You find the complete description of the limit switch configuration in the operating instruction manual for the corresponding control unit. Here a short description of the limit switches:

MINSTP - hardware limit switch (Limit switch), motor-side;
MINDEC - software limit switch (Brake switch), motor-side;
MAXDEC - software limit switch (Brake switch), motor-opposite side;
MAXSTP - hardware limit switch (Limit switch), motor-opposite side;
REF - reference limit switch MINSTP or MINDEC (only with SMS 60, to be defined using a hardware jumper on the corresponding axis module).

Limit switches
Check box **MINSTP** - activate or deactivate limit switch MINSTP.
Check box **MINDEC** - activate or deactivate limit switch MINDEC.
Check box **MAXDEC** - activate or deactivate limit switch MAXDEC.
Check box **MAXSTP** - activate or deactivate limit switch MAXSTP.
Check box **REF** - activate or deactivate limit switch REF (only for SMS 60).
Radio buttons **Low**, **High** - select polarity of corresponding limit switch (high active – NC contact to ground, low active – NO contact to ground).

Reference switch (with PS 90, PS 30, PS 35 and PS 10, to be defined using a software)
Radio buttons **MINSTP**… - define reference switch.
Radio buttons **Low**, **High** - select reference switch polarity (high active – NC contact to ground, low active – NO contact to ground).



Software limits (with PS 90, PS 30, PS 35 and PS 10, to be defined using a software)

Check box **S-MIN** - define software limit switch for negative direction (available / not available).

Text box with spin button - display and select position for software limit switch.

Check box **S-MAX** - define software limit switch for positive direction (available / not available).

Text box with spin button - display and select position for software limit switch.

These limit switches are evaluated only after a valid reference run. The limit position monitoring behaves with the exceeding software limit like the suitable DEC switch (MINDEC, MAXDEC). If a software switch is activated, only the movement is stopped, the motor is still switched on.

To check the test run you can use the controls indicating the current limit switch state.

Check box **MIN...** - display state of corresponding limit switch.

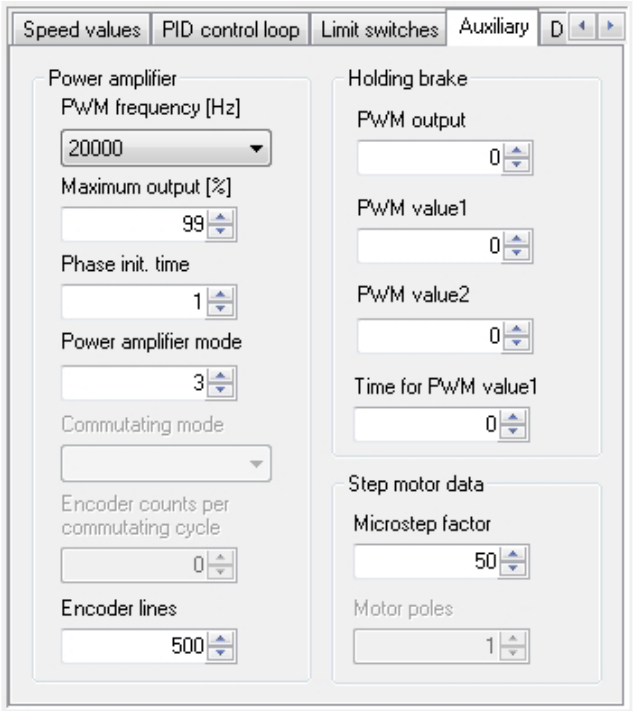
Check box **MAX...** - display state of corresponding limit switch.

Check box **S-MIN** - display state of the software limit for negative direction.

Check box **S-MAX** - display state of the software limit for positive direction.

With the **Save configuration** button you can save the limit switch configuration for the selected axis. With it the suitable values are sent to the control unit. Then the limit switch configuration and state are read out again and the controls are updated. Only the values assumed by the control unit are showed here.

In the following section (Tab “Auxiliary”) the additional parameters for the selected axis are indicated. They can be changed also. This data is specific for the control units PS 90, PS 30, PS 35 and PS 10. If the function is not available with the selected control unit or irrelevant for the defined motor type, the corresponding control is grayed out.



Power amplifier

Combo box **PWM frequency** - select PWM frequency of the power amplifier (in Hz).

Text box with spin button **Maximum output** - display and select maximum output value of servo loop in percent.

The maximum value of an axis which is given to the servo amplifier can be set with this setting. Max. valid value – 99%.

These values are valid only for the BLDC and step motor axes:
Text box with spin button **Phase init. time** - display and select phases initialization time (in sample time cycles)

These values are valid only for the BLDC and step motor axes (Closed-Loop):
Text box with spin button **Phase init. amplitude** - display and select phases initialization amplitude (in percent).

Control unit PS 30, PS 35 (Stepper-Open-Loop)
Text box with spin button **Power amplifier mode** - display and select power amplifier mode (time constant for de-energizing as number).
The value “0” corresponds to 0% (slow), 1 - 15%, 2 - 48%, 3 - 100% (fast). You find a description of the configuration for the power amplifier mode in the manual for the corresponding control unit.

Control unit PS 10
Text box with spin button **Power amplifier mode** - display and select power amplifier mode (as bit pattern).
The bits 0,1 define time constant for de-energizing (Stepper-Open-Loop). The value “0” corresponds to 0% (slow), 1 - 15%, 2 - 48%, 3 - 100% (fast). You find a description of the configuration for the power amplifier mode in the manual for the corresponding control unit.

These values are valid only for the BLDC:
Combo box **Commutating mode** - select commutating mode.
These values are valid only for the BLDC and step motor axes (Closed-Loop):
Text box with spin button **Encoder counts**… - display and select encoder counts for commutating cycle.
Text box with spin button **Encoder lines** - display and select encoder lines.

Holding brake
These values are used only for a holding brake configuration:
Text box with spin button **PWM output** - display and select allocation of the holding brake.
This is a number of the assigned PWM output (0 - no allocation).
Text box with spin button **PWM value1** - display and select the first PWM value of the holding brake.
This value is used for attracting at a control of the holding brake.
Text box with spin button **PWM value2** - display and select the second PWM value of the holding brake.
This value is used for holding at a control of the holding brake.
Text box with spin button **Time for PWM value1** - display and select time for the first PWM value of the holding brake.
At a control of the holding brake this value determines, how long the brake is attracted.

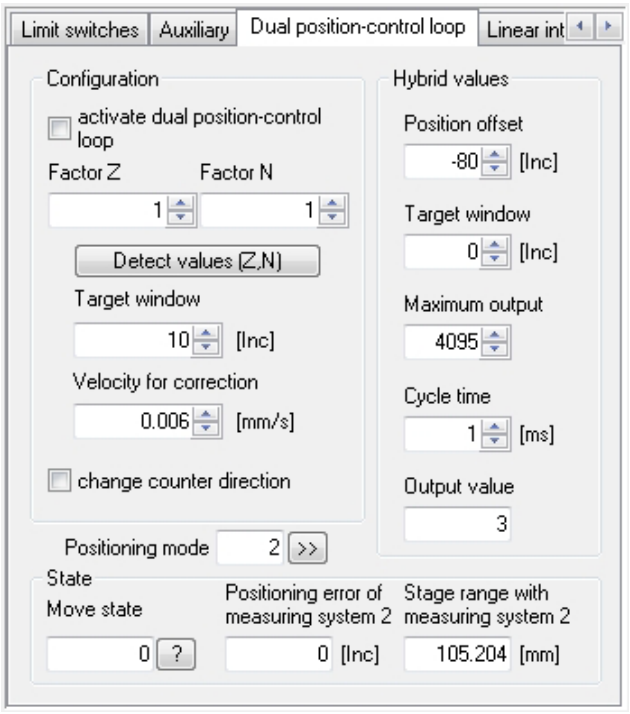
Step motor data
These values are valid only for the step motor axes:
Text box with spin button **Microstep factor** - display and select microstep resolution (microsteps per full step).
Text box with spin button **Motor poles** - display and select motor poles.

With the **Set one parameter** button you can save the last changed parameter for the selected axis. This is valid only for the selected tab.
With the **Set all parameters** button you can save all parameters for the selected axis. This is valid only for the selected tab.

In the following section (Tab “Dual position-control loop”) the additional parameters for dual position-control loop for the selected axis are indicated. They can be changed also. This data is specific for the control units PS 90, PS 30. If the function is not available with the selected control unit or irrelevant for the defined motor type, the corresponding control is grayed.
With the control unit PS 35 a special function is implemented here. The LCD display of the control unit can be configured (two factors for calculation and display mode).

Configuration
Check box **...dual position-control loop** – activate or deactivate dual position-control loop.
A dual position-control loop is possible only with a way measuring system which is connected to the

second encoder input (Dual encoder). The axis goes to a new target position or a distance either in the trapezoidal or S-curve profile with dual position-control loop, if the hardware is available and the option is activated. The setting is valid for this dialog window and for all work areas.
Please note that an axis goes to a new target position or a distance either with dual position-control loop or with linear interpolation or without both (standard positioning). If an option is activated, the other option is automatically deactivated. If none of the both is selected, the standard positioning is activated. The setting is taken over after the saving.



Text box with spin button **Factor Z** - display and select factor Z (numerator) of an axis with dual position-control loop.
A dual position-control loop is possible only with a way measuring system which is connected to the second encoder input (Dual encoder). This factor is used as a numerator for the conversion of the actor resolution in the resolution of the way measuring system for positioning with dual position-control loop.

Text box with spin button **Factor N** - display and select factor N (denominator) of an axis with dual position-control loop.
A dual position-control loop is possible only with a way measuring system which is connected to the second encoder input (Dual encoder). This factor is used as a denominator for the conversion of the actor resolution in the resolution of the way measuring system for positioning with dual position-control loop.

With the **Detect values (Z,N)** button the factors Z,N can be detected. They are dependent on the configuration of the positioning unit in the **Define positioning unit** dialog box (see chapter 3.6).

Control unit PS 35
Text box with spin button **Factor Z** - display and select factor Z (numerator) of an axis.
Text box with spin button **Factor N** - display and select factor N (denominator) of an axis.
This data is specific for the control unit. The factor Z is used as a numerator for the calculation of the resolution for LCD display. The factor N is used as a denominator for the calculation of the resolution for LCD display. The display counter (increments) is converted with the certain setting. For example, the configuration “Z=1, N=10000, Type=1” corresponds to the position output in mm with the resolution 0.0001 mm/Inc.
Text box with spin button **Display position** - show and select position of an axis in the display.
The values are in increments.

Text box **Display mode** - select display mode (as index) of an axis.
The following values are possible:
0 – position output in increments (no conversion),
1 – position output in mm,
2 – position output in µm,
3 – position output in degrees (deg),
4 – position output in mrad.

With the **Detect values (Z,N)** button the factors Z,N and a display mode can be detected. They are dependent on the configuration of the positioning unit in the **Define positioning unit** dialog box (see chapter 3.6). With the **Set all parameters** button you can save the parameters for the selected axis. This is valid only for the selected tab.

Text box with spin button **Target window** - display and select target window of an axis for movement end with dual position-control loop.
The values are in increments of a way measuring system.
Text box with spin button **Velocity…** - display and select velocity of an axis for correction with dual position-control loop.
The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. The parameter for velocity in the selected tab is read out once more and indicated (measuring unit "[xxx]"). A next double click (or profile selection) resets the indication of the velocity.

Check box **...counter direction** – change counter direction of a way measuring system of an axis (reversed or not reversed).

Text box **Positioning mode** - select positioning mode (as index) of an axis with dual position-control loop.
If you do not know the type, you can click the "**>>**" button. A dialog box appears with descriptions of all types of the positioning mode. A dual position-control loop is possible only with a way measuring system which is connected to the second encoder input (Dual encoder). Please note that the dual position-control loop of an axis remains active in the positioning mode 2,3,7,9, if the position is reached (phase 3 active). In this state only a further positioning with a dual position-control loop is possible. To use another positioning type (e.g., reference run), you can break the dual position-control loop with the **Stop** button or deactivate this option (standard positioning activated).

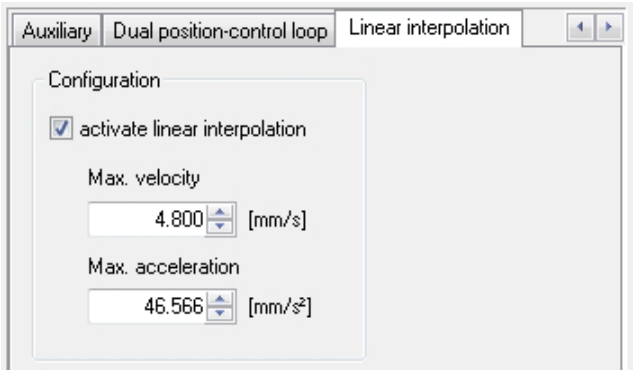
Control unit PS 90
Hybrid values
These values are valid only for the positioning with mode 6,7,8,9 (hybrid mode, phase 3):
Text box with spin button **Position offset** - display and select signed offset to target position of an axis with dual position-control loop.
The values are in increments of a way measuring system.
Text box with spin button **Target window** - display and select target window of an axis for finish of the hybrid positioning with dual position-control loop.
The values are in increments of a way measuring system.
Text box with spin button **Maximum output** - display and select maximum hybrid output value of an axis.
Text box with spin button **Cycle time** - display and select cycle time of the hybrid positioning of an axis with dual position-control loop.
Text box **Output value** - display current hybrid output value of an axis.
The hybrid component can be connected to an analog output. The analog outputs can generate voltage between 0 and 4.095V which are defined with 12-bit resolution (0...4095).

To check the test run you can use the following controls ("State").
Text box **Move state** - display move state of an axis with dual position-control loop.
Text box **Positioning error…** - display current positioning error of a way measuring system.
The values are in increments of a way measuring system.
Text box **Stage range…** - display stage range of an axis.
After the valid reference run with mode 6 or 7 it returns the ascertained stage range. The measuring unit of the stage range is the same as for the position output for the assigned axis.

With the **Set one parameter** button you can save the last changed parameter for the selected axis. This is valid only for the selected tab.
With the **Set all parameters** button you can save all parameters for the selected axis. This is valid only for the selected tab.

In the following section (Tab “Linear interpolation”) the additional parameters for linear interpolation for the selected axis are indicated. They can be changed also. This data is specific for the control units PS 90, PS 30 and PS 35. If the function is not available with the selected control unit or irrelevant for the defined motor type, the corresponding control is grayed.

Configuration
Check box **...linear interpolation** - activate or deactivate linear interpolation.
The axis goes to a new target position or a distance either in the trapezoidal or S-curve profile with linear interpolation, if the option is activated. If this option is activated with several axes of the same control unit, such axes go synchronically with linear interpolation. The setting is valid for this dialog window and for all work areas.
Please note that an axis goes to a new target position or a distance either with dual position-control loop or with linear interpolation or without both (standard positioning). If an option is activated, the other option is automatically deactivated. If none of the both is selected, the standard positioning is activated. The setting is taken over after the saving.



Text box with spin button **Max. velocity** - display and select maximum velocity of an axis with linear interpolation.
The physical units for velocity and speed output data are identical. A double click on the measuring unit switches the indication of the velocity to internal values. The parameter for velocity in the selected tab is read out once more and indicated (measuring unit “[xxx]”). A next double click (or profile selection) resets the indication of the velocity.
Text box with spin button **Max. acceleration** - display and select maximum acceleration of an axis with linear interpolation.
The physical units for acceleration and speed output data are identical (Hz – internal values).

With the **Set one parameter** button you can save the last changed parameter for the selected axis. This is valid only for the selected tab.
With the **Set all parameters** button you can save all parameters for the selected axis. This is valid only for the selected tab.

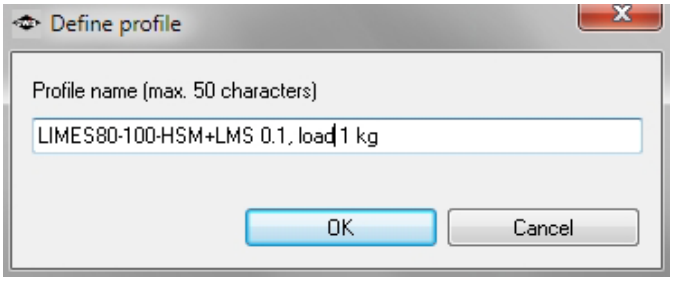
With the parameter transfer the suitable values are sent to the control unit. Then the axis parameters are read out again and the controls are updated. Only the values assumed by the control unit are showed here. You can find the allowed value ranges for the parameters in the operating instructions of the control units. If the application has no connection with the control unit, the null value is showed in the controls.
You can test the adjusted axis parameters by means of reference run or short-distance run. In order to do this you have to select the type of reference run or a certain distance. Afterwards, a reference or a test run can be executed.

Text box **Type** - select type of reference run (as index).
If you do not know the type, you can click the "**>>**" button. A dialog box appears with descriptions of all reference run types.

Text box **Limit switch hysteresis** - display limit switch hysteresis (only for PS 90, PS 30, PS 35, PS 10, SMS 60).
This data is specific for each control unit. If the function is not available for the selected control unit, the corresponding control is faded out.
With the **Start** button you can start the reference run for the selected axis.

A click on the **Show axis state** button displays the **Axis state** dialog box. The according axis is selected.
With the **Forward** button you can start the test run for the selected axis into positive direction.
With the **Backward** button you can start the test run into negative direction.
With the **Stop** button you can immediately interrupt each positioning process (reference run, test run).
With the **Close** button you can close the dialog box at any time.

To check the test run you can use the controls indicating the current limit switch state (Tab "Limit switches"), and also the other check values.
Text box **Distance** - select distance for test run.
The measuring unit is the same as for the position output for the assigned axis.
Text box **Current position** - display current axis position.
The measuring unit is the same as for the position output for the assigned axis.
Text box **Positioning error** - display current positioning deviation for the selected axis.
The positioning deviation is the difference between the actual position and the desired position.
Label **Time for readjustment** - display time necessary for readjustment.
This data is specific for each control unit. If the function is not available with the selected control unit, the corresponding control is grayed or faded out. The adjustment will be displayed only for the hardware adjustment of the control units PS 90, PS 30, PS 35, PS 10 and DC 500.



Because of the complexity of the axis parameters you have the possibility to store these settings as a profile under a certain name, which may consist of up to 50 characters (**Create new profile** button). A dialog box appears, enter the profile name. With the **OK** button you can save the parameters into the program database as a new profile; the dialog box will be closed. With the **Cancel** button you discard the new profile; the dialog box will be closed.

! We recommend putting as much data in coded form as possible in the profile name in order to facilitate later use. Example: "LIMES80-100-HSM+LMS 0.1, Y, load 1 kg" could designate a linear measuring stage LIMES80 with stepper motor and linear measuring system with 0.1 µm resolution, installed as y axis and with 1 kg load, e.g.

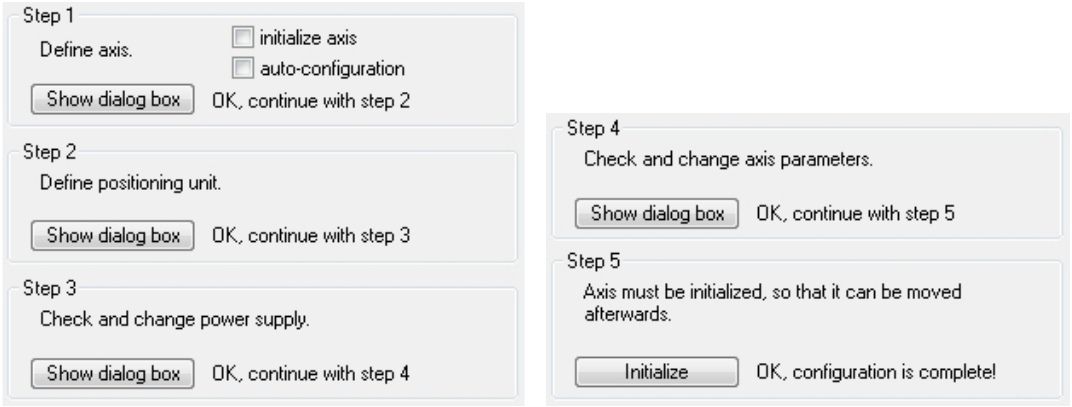
Notes:

- If a profile has to be updated, you have to select the appropriate profile name which must appear in the **Select profile** combo box. The parameters will be adapted in the controls. Then they are sent to the control unit. One can store the parameters assumed by the control unit as the updated configuration (**Update profile** button).
- If a profile has to be deleted, you have to select the appropriate profile name in the **Select profile** combo box (**Clear profile** button).
- Nevertheless, a profile with empty name can be displayed in the combo box, and it can be invoked or deleted.
- Profile names are not checked. You can open and manage as many profiles having the same name as you wish. The software-internal distinction between different profiles is done by a sequential number, which, however, is not visible for the user.

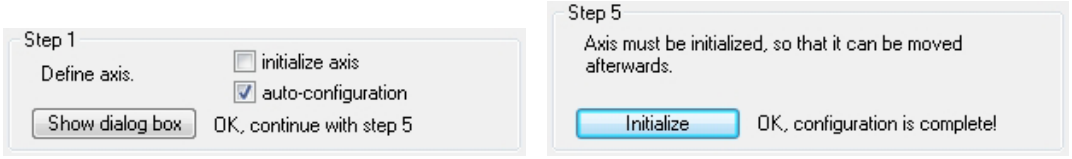
All selected parameters as well as all axis identifiers are saved in the configuration file with the extension “owi” for a particular control unit.

3.9 Wizard for an axis configuration

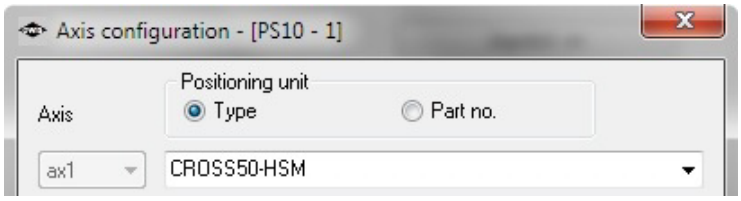
In this dialog box an axis configuration is possible for the selected control unit (the active window). Every axis can be prepared for the work (configured) step by step.
Manual configuration – from step 1 to step 5.



Check box **initialize axis** - “controlled” initializing of the axes.
If this option is activated, the axis is initialized automatically after the step 1 (**Define axes** dialog box). Otherwise it can be initialized in the step 5.
Check box **auto-configuration** - activate automatic axis configuration.
If this option is activated, the axes can be configured automatically after the step 1 (**Axis configuration** dialog box). Then they can be initialized in the step 5.

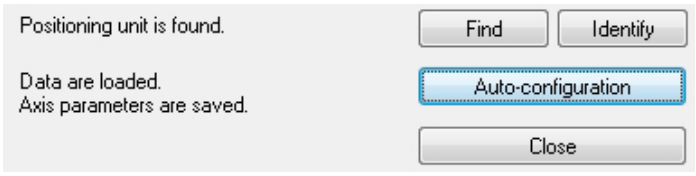


Automatic configuration – step 1 and step 5.



Combo box **Axis** - axis identifier is selected automatically.
The parameters are specially defined for each control unit axis.

Combo box **Positioning unit** - select positioning unit.
In order to simplify the setting you can select a suitable positioning unit from the defined program database. To the search the type name (pre-setting) or the article number (part no.) can be used. After the string input the positioning unit can be selected in the list element of the combo box. The searching process can be also started with the **Find** button or with the **Identify** button (OWISid chip). If the function is not available with the selected control unit or the corresponding hardware component was not found, the control is deactivated.

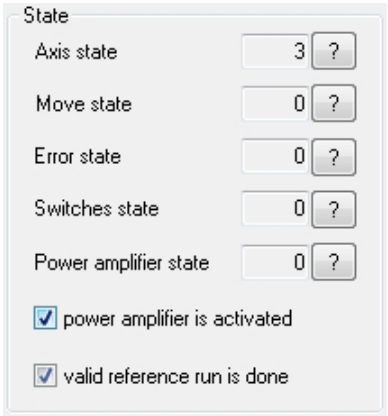


Button **Auto-configuration** - configure axis automatically.
After the selection the data saved in the program database are used for the axis configuration.
If the axes are defined, and the desired parameters are set, the preparatory phase has been completed.
Using the **Close** button you can close the dialog box any time.

3.10 Axis state

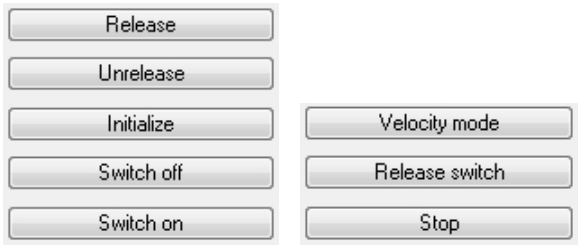
In this dialog box the state information for an axis and its power amplifier are displayed for the selected control unit (the active window). Only for PS 90, PS 30, PS 35, PS 10.
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 3.3).

Text box with spin button **Axis** - select control unit axis.
The axis assignment for PS 10: axis1 belongs to master(1), axis2 – slave1(101), axis2 – slave2(102) etc. To work with the axes 2,3…, the software needs an assigned bus address (slave ID) for suitable slave unit (menu “Control/CanOpen slaves”). After the axis selecting the status information is updated.



State
Text box **Axis state** - display axis state (as number).
Click the “**?**” button for more information. A dialog box appears with the state description.
Text box **Move state** - display move state (as number).
Click the “**?**” button for more information. A dialog box appears with the state description.
Text box **Error state** - display error state (as number).
Click the “**?**” button for more information. A dialog box appears with the state description.
Text box **Switches state** - display limit switch state (as number).
Click the “**?**” button for more information. A dialog box appears with the state description.
Control unit PS 90, PS 10
Text box **Power amplifier state** - display power amplifier state (as number).
Click the “**?**” button for more information. A dialog box appears with the state description.

Check box **power amplifier...** - display power amplifier (enable) state.
Check box **valid reference run…** - display validity of an axis reference run.



With the **Release** button the axis is released for the control.
With the **Unrelease** button the axis is excluded from the control (unreleased).
With the **Initialize** button the axis is initialized and switched on.
With the **Switch off** button the axis is switched off.
With the **Switch on** button the axis is switched on.
With the **Velocity mode** button you can start velocity mode of an axis.
A click displays the **Select speed for positioning** dialog box. The physical units for velocity and speed output data are identical. Here you can change the target velocity and start the velocity mode (**Set & start** button).
With the **Release switch** button you can release active limit switches of an axis.
With the **Stop** button you can immediately interrupt each positioning process.

With the **Save axis parameters to FRAM** button you can save axis parameters in the control unit memory (PS 10, Save axis parameters to EEPROM).
With the **Reload axis parameters from FRAM** button you can load axis parameters from the control unit memory.
With the **Export parameters** button you can read out the axis parameters and save them into a text file with the extension “owd”.
With the **Import parameters** button you can load the axis parameters from a text file with the extension “owd” and save them.
Using the **Close** button you can close the dialog box any time.

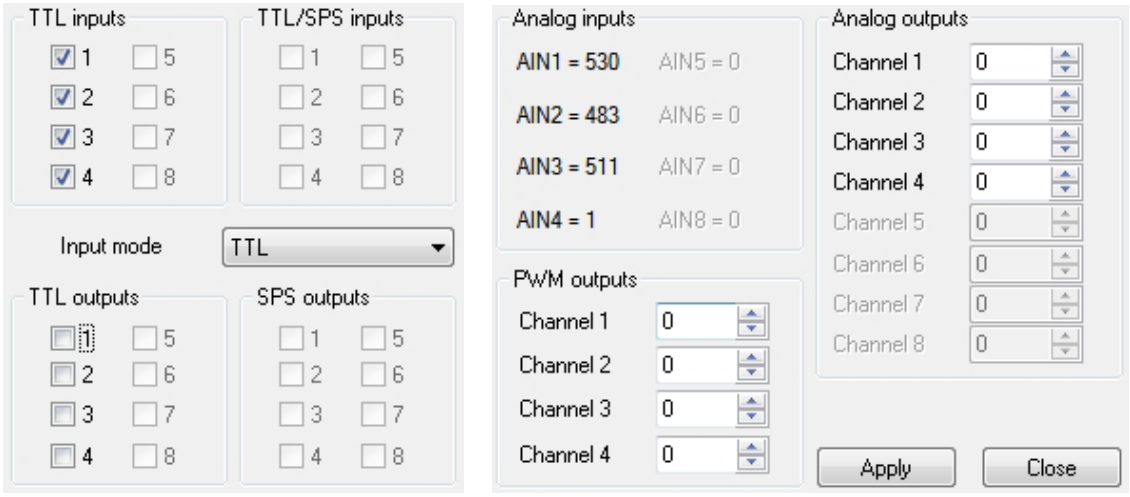
3.11 Inputs and outputs

In this dialog box the state of the inputs and outputs are displayed for the selected control unit (the active window). Only for PS 90, PS 30, PS 35, PS 10. With PS 10 you can select whether inputs and outputs of the master or the slave unit are displayed.
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 3.3).

The control unit PS 90 is equipped with 16 digital inputs, 16 digital outputs, 8 analog inputs, 8 analog outputs and 4 PWM outputs. The digital inputs (1...8) are TTL inputs. The digital inputs (9...16) are SPS inputs. The digital outputs (1...8) are TTL outputs. The digital outputs (9...16) are SPS outputs.
The control unit PS 30 is equipped with 8 digital inputs, 5 digital outputs, 8 analog inputs and 2 PWM outputs. The digital inputs (1...8) are TTL inputs. The digital outputs (1...5) are TTL outputs.
The control unit PS 35 is equipped with 8 digital inputs, 5 digital outputs, 8 analog inputs and 2 PWM outputs. The digital inputs (1...8) are TTL inputs. The digital outputs (1...5) are TTL outputs.
The control unit PS 10 is equipped with 4 digital inputs, 5 digital outputs, 4 analog inputs and 2 PWM outputs. The digital inputs (1...4) are TTL inputs. The digital outputs (1...4) are SPS outputs. The digital output (5) is a TTL output.
If the function (input or output) is not available or not released with the selected control unit, the corresponding control is grayed.

TTL inputs
Check boxes **1...8** - show state of the TTL inputs.

TTL/SPS inputs
Check boxes **1...8** - show state of the SPS inputs (only for PS 90).
The input level of the SPS inputs can be switch to TTL.



Combo box **Input mode** - select level of the SPS inputs (only for PS 90).
With it the current level of the SPS inputs is defined. The digital inputs (1...8) are TTL inputs. The digital inputs (9...16) are SPS inputs whose input level can be switch to TTL.
Combo box **Output mode** - select output mode for the digital outputs (only for PS 10).
With it the output mode for the digital outputs 1 and 2 is defined. These outputs can work as digital SPS outputs or as PWM outputs alternatively.

TTL outputs
Check boxes **1...8** - show and change state of the TTL outputs (only for PS 90, PS 30, PS 35, PS 10).

SPS outputs
Check boxes **1...8** - show and change state of the SPS outputs (only for PS 90, PS 10).

Analog inputs
Text boxes - show values of the analog inputs.
The analog inputs can measure voltage between 0 and 4.092V with the PS 90 directly and convert it with 10-bit resolution (0...1023). The analog inputs can measure voltage between 0 and 5V with the PS 30, PS 35 and the PS 10 directly and convert it with 10-bit resolution (0...1023).

Analog outputs
Text box with spin button **Channel 1**… - show and change values of the analog outputs (only for PS 90).
The analog outputs can generate voltage between 0 and 4.092V which are defined with 10-bit resolution (0...1023).

PWM outputs
Text box with spin button **Channel 1**… - show and change values of the PWM outputs (in percent).

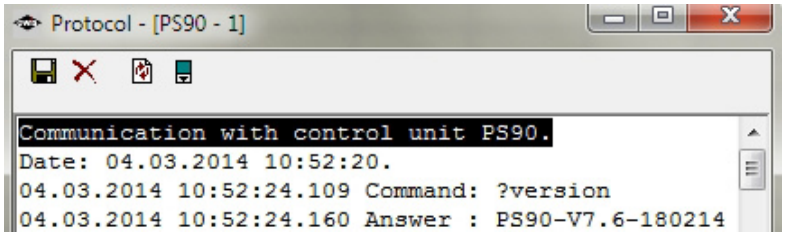
Combo box **Control unit** - select control unit (only for PS 10).
The axis assignment: axis1 belongs to master(1), axis2 – slave1(101), axis2 – slave2(102) etc. To work with the axes 2,3…, the software needs an assigned bus address (slave ID) for suitable slave unit (menu “Control/CanOpen slaves”).

Using the **Apply** button you can set values for the analog and PWM outputs.
Using the **Close** button you can close the dialog box any time.

3.12 Protocol

OWISoft offers the possibility to log the interface communication from the software to the control unit (the commands sent from the software and the answers received by the control unit). Two versions are possible, a long and a short protocol. The short version contains a head with name of the control unit and the starting time, as well as a list of the commands sent and the answers received. The long

version also contains the corresponding transmitting and receipting times, and the device status signals are displayed additionally. The long version increases the communication time slightly.
The **Protocol** dialog box contains the information of the protocol file for the selected control unit (the active window).
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 3.3).


Protocol - [PS90 - 1]
Communication with control unit PS90.
Date: 04.03.2014 10:52:20.
04.03.2014 10:52:24.109 Command: ?version
04.03.2014 10:52:24.160 Answer : PS90-V7.6-180214

The control functions are implemented by using a toolbar. It appears horizontally on top of the dialog box underneath the title bar. The following actions are possible:

Click	To
	Saves window data to file.
	Deletes window data. If the protocol function is still activated, you can restore the complete window information by clicking the button.
	Determines whether the protocol window is updated continuously or not. If the update function is switched off, the activated protocol keeps running in the background.
	Determines whether the beginning or the end of the log file is displayed in the protocol window. An activated button displays the last, i.e. most current protocol lines.

! Please note that the log file can increase enormous rapidly. Updating the protocol window in such a case takes much time and slows the software down unnecessarily. We recommend running the protocol in the background without updating the protocol window. The protocol can be stored and evaluated later.

3.13 Calibration options

In the **Calibration options** dialog box you can specify the sequence for calibration and measure the available travel ("Range measurement"). The axis-based configuration applies to all connected control units.

Combo box **Order of** - select configuration.
Text box **A1** - display axis identifier.
Radio buttons **1**, **2**.. - select sequence.
Each axis gets a number, with which it is started for calibration and travel measuring. If the radio buttons for an axis are not activated (without points), this axis will not be started. If the saved axis number is larger than the total number of axes, this axis is deactivated.

Text box **Type** - select calibration type (as index).
If you do not know the type, you can click the "**>>**" button. A dialog box appears with descriptions of all reference run types.
Text box **Offset** - select offset value.
During the calibration, a defined reference point will be reached. Depending on the control unit type and features of the positioning unit different reference versions are available. For further information, please see the control unit reference manual. You also have the possibility of defining an offset which is the travel after reaching the reference position, in order to define individual, user specific points of reference. The offset value and the position output have the same measuring unit (e.g. "mm").
You may - for each axis - define the sequence, in which the calibration procedure is started. This is necessary in order to give you the possibility of preventing possible axis collisions because of an uncoordinated axis starts during the reference run.

! Please note that axes belonging to physically separated controls can be started at the same time, in order to save time, if mechanically possible, i.e. when mechanical collision is impossible.

A logical plausibility check is done when defining the sequence. You cannot select a calibration sequence which is not possible. With the control units DC 500 and SMS 60, for instance, you can only make a reference run for one axis at the same time.

With the **Save configuration** button you can save the calibration settings.

The range measurement defines the entire available travel from inactive limit switch to inactive limit switch. The first to be approached is the limit switch at the end of the travel (positive direction: MAXSTP or MAXDEC); the release position will be saved. The limit or reference switch at the beginning of the travel will be reached afterwards (negative direction: MINSTP or MINDEC, with linear stages at the motor side). The position value will be saved. The difference between both saved positions is the available travel.

A travel measurement is only possible with linear or rotary stages, which are equipped with limit switches at both ends or with a single switch (rotary stage). With the control units DC 500 and SMS 60 the rotary stages do not have this option (the corresponding controls are grayed out).
For a travel measurement the values **Type** and **Offset** are not available (are deactivated).

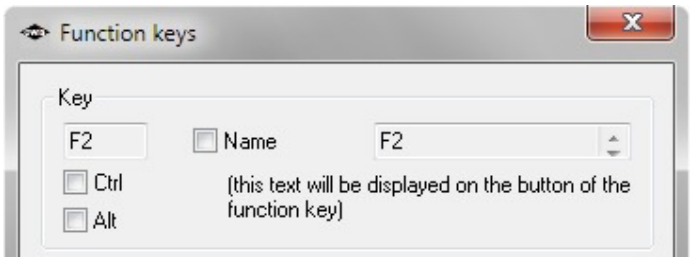
Using the **Save configuration** button you can save the measurement configuration.
Using the **Close** button you can close the dialog box any time.

The calibration and the travel measurement can be started in the **Free positioning** work area, after the required settings are done.
All configuration parameters as well as all axis identifiers are saved in the configuration file with the extension "owi" for a particular control unit.

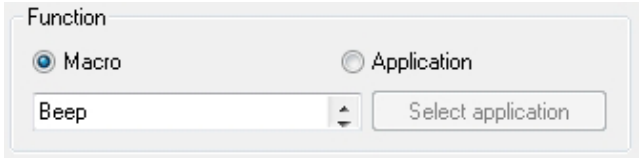
3.14 Function keys

The **Function keys** dialog box describes the key labels and the functions, which are linked with the appropriate keys. The configuration is key-oriented and applies for one key.

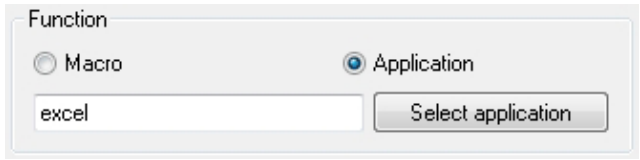
Text box **Key** - display corresponding function key on the keyboard.
Please note: when the **OWISoft** software is running, it monopolizes the function keys of the keyboard. If another running application uses the same function keys, they are without function (as long as **OWISoft** runs). To avoid such a collision, please define the key combination for a function key (e.g., F... + Ctrl + Alt). To do so, please activate the suitable check box.



Check box with Text box **Name** - display the defined key label.
To set an individual key name, please activate the check box. Afterwards, you can enter the desired text into the text box. A multiline name is possible. You can also resize the function keys.



Radio button **Macro** - activate the Macro function.
If this option is activated, the text box is interpreted as a command line. Here you can enter the commands from the program script (one command per line). The lines are executed successively. Only some commands are possible: MoveAbs, MoveRel, Stop, SetTarget, SetPosition, SetVel, SetAccel, MessageBox, MessageBoxDelay, JoystickOn, JoystickOff, Delay, Beep, WaitForInput, SetPTrigger, SetNTrigger, GoVel, SetMem, SetMem16, SetMem32, WaitForMem, WaitForMem16, WaitForMem32, MoveAxis, AninToFile, AninToTab (only for **Chain** work area), FileValueToTab (only for **Chain** work area), ExecCmd. Short command descriptions can be found in chapter 4.4.2.

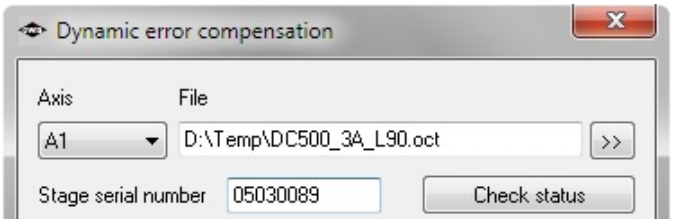


Radio button **Application** - activate the Application function.
If this option is activated, the content of the text box is interpreted as a file path. By pressing the function key, this file (an application) is executed or opened with the suitable software. You can define the software installed under Windows by their name (without path designation), for example, "excel". You may select the path in a dialog box, when using the **Select application** button. An application can be started with parameters (see ExecWait from the program script). Short command description can be found in chapter 4.4.2.
If you repeat clicking on the radio button, you deactivate this option. If no option is selected, the key has no linked function.
With the **Apply** button you can save the configuration for the selected function key.
The **Next** button displays the configuration of the next function key.
The **Previous** button displays the configuration of the previous function key.

Using the **Close** button, you can close the dialog box anytime.

3.15 Dynamic error compensation

The **Dynamic error compensation** dialog box displays the configuration of the position correction for the selected axis. The configuration defined is specific for each axis. Here you can activate or deactivate the position correction.



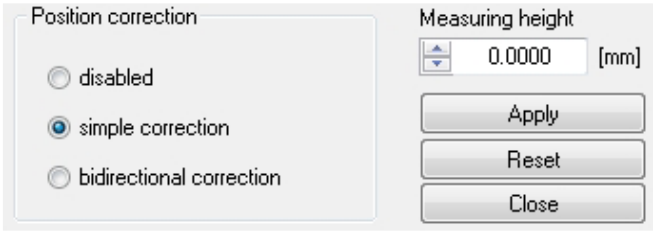
Combo box **Axis** - select axis identifier.
The configuration is specially defined for each axis.
Text box **File** - enter path to the OWIS® correction table (file extension “oct”).
Click on the “**>>**” button to open a dialog box, in which you can load the desired file. The files containing the correction data are supplied by OWIS GmbH.

Text box **Stage serial number** - define stage serial number
(correction data are valid only for the associated stage).

Press the **Check status** button in order to generate and display a correction status report for the selected axis (DEC = dynamic error compensation). There are the following values:

- Correction status (DEC Status);
- Name of the OWIS® file (OWIS File);
- Number of the target positions in the saved correction table (Saved Target Pts);
- Type of the correction which is possible with saved data (DEC Type);
- Range in which the positions can be corrected (Min Value and Max Value).

The last values are given in Inc (internal values of the control unit) or in mm for linear stages, or in degrees for rotary stages.



Radio button **disabled** - deactivate position correction.
Radio button **simple correction** - activate simple position correction.
Radio button **bidirectional correction** - activate bidirectional position correction.

Text box with spin button **Measuring height** - select measuring height for the position correction.

Press the **Apply** button in order to save the configuration for the selected axis.
Press the **Reset** button in order to reset the configuration for the selected axis. Besides, the software data are deleted and the position correction is deactivated.

Press the **Close** button to close the dialog box any time.

3.16 Continuous-path control

The **Continuous-path control** dialog box enables to define continuous-path control and to execute it for the selected control unit (the active window). Only for PS 90, PS 30, PS 35.
Control unit type and index are displayed (in square brackets) in the title bar of the window (see chapter 3.3).
The control is axis-based and applies to the selected control unit.

Index	dc1	sm2	--3	--4	--5	--6	--7	--8	Time [ms]	Function	Error	Release	Velocity	Accel.
0	-0.669	0.500	0	0	0	0	0	0	500	17	0	3	0.977	93.132
1	-1.830	0.366	0	0	0	0	0	0	500	17	0	3	0.715	93.132
2	-2.500	0.134	0	0	0	0	0	0	500	17	0	3	0.262	93.132
3	-2.500	-0.134	0	0	0	0	0	0	500	17	0	3	-0.262	93.132

The data for continuous-path control are stored in the memory of the control unit, in a table. This table is defined as an ActiveX control, having a table format. In the first row of the table (heading line) you find the axis identifiers for all defined axes. For a not defined axis the axis number stands here (e.g., “— 2”). In the first column of the table you find the coordinate set numbers (as index), from 0 to 1999.

The table exists of 2000 lines. Every line exists of 14 elements:
1,2,3,4,5,6,7,8 – distance with sign for the corresponding axis (-32760...+32760 increments);
Time - time interval in ms (20...1638);
Function - function code (16 bits – bit pattern);
Error - error byte (8 bits – axis 1 (bit0), axis 2 (bit1) etc.);
Release - release byte (8 bits – axis 1 (bit0), axis 2 (bit1) etc.);
Velocity - after the table check calculated speed (internal values);
Accel. - after the table check calculated acceleration (internal values).

Function code

With a function code the velocity mode for continuous-path control can be defined and the current state of three digital outputs can be changed.
Bits 0-14 – control of digital outputs:
- bits 0…3 – output number 1 (0 – deactivated);
- bit 4 - output state (0,1 – low,high);
- bits 5…8 – output number 2 (0 – deactivated);
- bit 9 - output state (0,1 – low,high);
- bits 10…13 – output number 3 (0 – deactivated);
- bit 14 - output state (0,1 – low,high).

Bit 15 – velocity mode for continuous-path control:
- 0 – moving with constant velocity;
- 1 – moving with constant acceleration.

Several functions for editing and navigating in the table are available. There are two operating modes: Read mode and Editing mode. In the read mode you can edit the whole table, in the editing mode only the selected table cell.

Editing mode.

In order to activate this mode, please select a cell; confirm the selection by double clicking or by pressing the Enter key. You can also enter the value directly. The colour of the cell changes to white and its contents are marked. Now you can handle the cell like a text field. If you press the Enter key again, you will leave the editing mode. The color of the cell changes and its contents are displayed as formatted. Their format is the same as the one of the position outputs for the assigned axis. If no axes have been assigned, the output is unformatted. You can also leave this mode by pressing the Page Up and Page Down keys. Using the Tab key you can rapidly handle several cells in the editing mode. Having activated the editing mode you enter the new value, e.g. pressing the Tab key, you add the new value and activate the editing mode for the next cell at the same time.

Read mode.

If the editing mode is not activated, the table is in read mode. You can navigate in the table and edit the selected (marked) cells. You can select the desired position (cell) with the mouse. You can, of course, use the keyboard as well:

Right arrow key
: Go to next table column.

Left arrow key
: Go to previous table column.

Down arrow key
: Go to next table row.

Up arrow key
: Go to previous table row.

Home key
: Go to first table column.

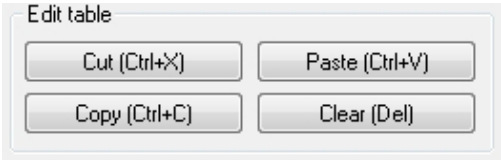
End key
: Go to last table column.

Page Down key
: Go to last table row.

Page Up key
: Go to first table row.

Tab key
: Go to next table cell. If the last table cell is reached, the first cell will be selected.

You can also select (mark) more than one cell using the keyboard or the mouse. The left upper table cell of the selection is interpreted as reference cell. To edit the marked table selection, the following functions are available:



Cut
Button and Keys **Ctrl+X**.
Removes the selected data in the control (table) and moves it to the clipboard.

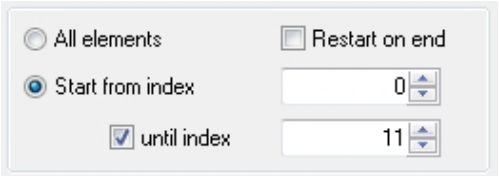
Copy
Button and Keys **Ctrl+C**.
Copies the selected data in the control (table) to the clipboard.

Paste
Button and Keys **Ctrl+V**.
Inserts a copy of the clipboard contents at the marked table cell. The cell contents are substituted with the contents of the reference cell. Besides, the lower cells, which correspond to the before marked table area, are overwritten.

Clear
Button and Key **Del**.
Removes the selected data in the control (table).

An Excel worksheet can be copied similarly. Please start the Excel application and load the desired worksheet. Mark the desired range of cells and copy them to the clipboard. Afterwards, activate the **OWISoft** window (**OWISoft**, **Continuous-path control** dialog box). Then select the desired table cell and insert the contents of the clipboard. To separate integer and fractional digits, the decimal point is valid only. When transferring the data, all commas are replaced by points.

With the **Load values** button the selected lines are read in the control unit and are inserted to the table in the dialog.
With the **Save values** button the selected lines from the table are saved in the control unit.
With the **Import** button you can load the table values from a text file with the extension “owv”. The table values are updated.
With the **Export** button you can save the table values into a text file with the extension “owv”. The table values can be backed up with it. After a control unit restarting these values are lost (table is reset).



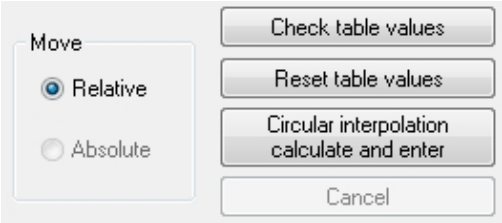
Radio button **All elements** - select table lines for function (all 2000 lines).
If the option is selected, the table is executed sequentially from the first to the last line.

Radio button **Start from position** - select table lines for function (selected lines).
Text box with spin button **...from position** - select start line.
If this option is selected, the table is executed beginning from this line.

Check box **until position** - activate end line monitoring.
Text box with spin button **until position** - select end line.

If the monitoring is active, the table is processed up to the defined end line. This applies only to the second version (executing of the selected lines). If the control is not activated, the table is executed up to the last line.

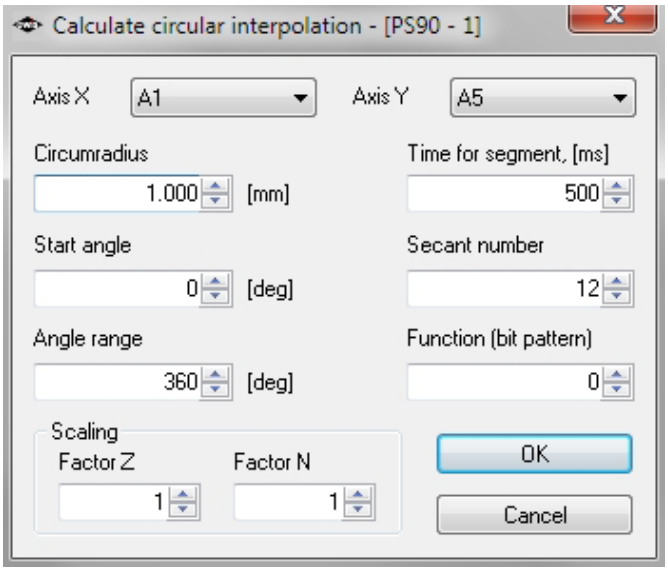
Check box **Restart on end** - activate continuous execution of the table for continuous-path control (important only for the execution of the continuous-path control).
If the option is active, the table for continuous-path control is executed as a loop. If the last position is reached, the execution of the table continues with the first line etc. If the continuous-path control is started, it is accomplished by the control unit (hardware). The actual position in the table cannot be determined.
A continuous-path control is finished:
1. if defined rows of the table are processed.
2. if a row with release byte cleared (=0) is processed.
3. if all rows of the table are processed.



With the **Check table values** button the selected lines are checked, read in the control unit and are inserted to the table in the dialog. A plausibility check of the table for continuous-path control can be carried out with this function. The limit values for speed and acceleration are calculated and entered in the rows of the table. The axis parameters for speed and acceleration are checked and the error byte is set accordingly (axis 1 (bit0), etc).

With the **Reset table values** button the selected lines are deleted, read in the control unit and are inserted to the table in the dialog. Besides, the values are set in the suitable rows to zero.
With the **Circular interpolation calculate and enter** button the selected lines are calculated for circular interpolation, read in the control unit and are inserted to the table in the dialog. Click on the button to open a dialog box, in which you can create a configuration of the circular interpolation.

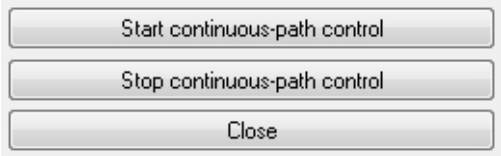
Combo box **Axis X** - select axis X for circular interpolation.
Combo box **Axis Y** - select axis Y for circular interpolation.
Text box with spin button **Circumradius** - define circumradius for circular interpolation.
The measuring unit is the same as for the position output for the assigned axis.
Text box with spin button **Time for segment** - define time interval for segment in ms.



Text box with spin button **Start angle** - define start angle in degrees.
Text box with spin button **Angle range** - define angle range in degrees.

Text box with spin button **Secant number** - define secant number for circular interpolation.
Text box with spin button **Function** - define function code (16 bits – bit pattern).
For more information see a description of the table for continuous-path control.
Text box with spin button **Factor Z** - define optional: scaling factor Z (numerator).
Text box with spin button **Factor N** - define optional: scaling factor N (denominator).

Pressing the **OK** button you can save the configuration for circular interpolation and close the dialog box.
With the **Cancel** button you can close the dialog box any time. The configuration is not saved.



With the **Start continuous-path control** button you can start a continuous-path control for the selected rows.
With the **Stop continuous-path control** button a running continuous-path control can be stopped. The moving axes behave like at the end of the table.

With the **Cancel** button you can terminate each running process.
With the **Close** button you can close the dialog box any time.

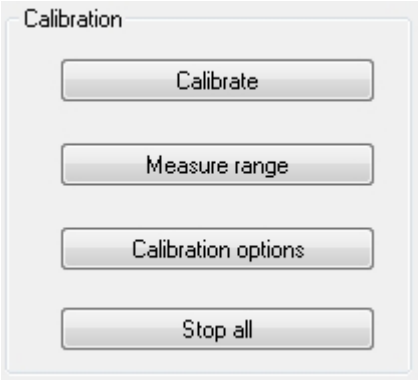
4 Work areas

4.1 Free positioning

Using the **Free positioning** work area, you can select connected axes in order to position them relatively or absolutely. Furthermore, it is possible to define actual positions of the axis counters as well as the current position as Home position in order to reach it again. You can select an axis by marking the **active** check boxes.
The control is axis-based and applies to all connected control units.

Text box **A1** - display axis identifier.
Text box - define axis position.
The measuring unit is the same as for the position output for the assigned axis.
Check box **active** - select axis for the action.
If the axis has been deactivated during the positioning (check box is empty), this axis will be immediately stopped. This applies only to the current positioning process.

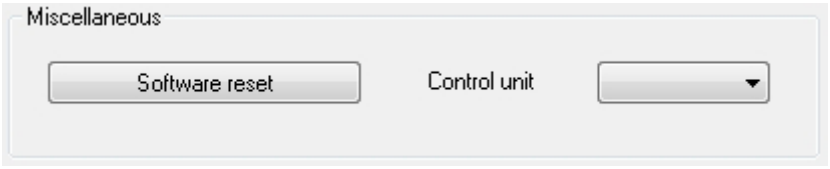
Using the **Move relative** button you can start the selected axes (**active** check box), the defined values are interpreted as travel distances.
Using the **Move absolute** button you can start the selected axes (**active** check box), the defined values are interpreted as target positions.
Using the **Move to home position** button you can start motion of the selected axes (**active** check box) to the saved home positions. The axes on one control unit (PS 90) will be started synchronously.
Using the **Set home position** button you can save the current positions for the selected axes (**active** check box) as home position (default: 0). The value of the home position is displayed in the **Define positioning unit** dialog box.
Using the **Set position** button you can save the defined positions for the selected axes (**active** check box) as actual position of the axis counters.
Please note that the dual position-control loop of an axis remains active in the positioning mode 2,3,7,9 (see **Axis parameters** dialog box, Dual position-control loop), if the position is reached (phase 3 active, magenta colour). In this state only a further positioning with a dual position-control loop is possible. To use another positioning type (e.g., reference run), you can break the dual position-control loop with the **Stop all** button (or **active** check box).



The **Calibration** function block permits the start of calibration or range measurement, as well as the configuration of the calibration and measurement settings.
By pressing the **Calibrate** button you can start the calibration.
If the axis is not defined for calibration, this command does not have any effect for the axis (see **Calibration options** dialog box). The new generated axes (**Define axes** dialog box) are predefined for calibration (pre-setting, type=4).

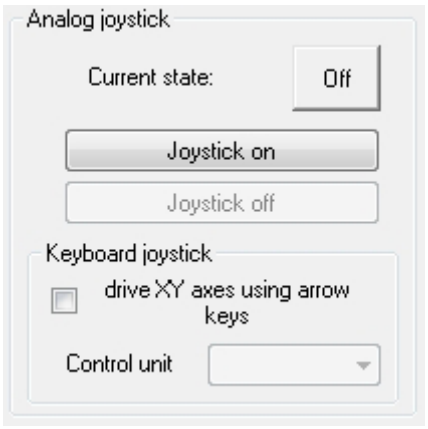
Using the **Measure range** button you can start the travel measuring.
If the axis is not selected for measurement, this command does not have any effect for the axis (see **Calibration options** dialog box). The new generated axes (**Define axes** dialog box) are not defined for travel measurement (pre-setting).
Using the **Calibration options** button the **Calibration options** dialog box is opened.
With the **Stop all** button you can stop the action of all axes, the calibration and the travel measurement.

The **Miscellaneous** function block enables you to reset the software for the selected control unit.



Combo box **Control unit** - select control unit (see chapter 3.3).
Using the **Software reset** button you reset the selected control unit. The control unit is reset to its initial state.

The **Analog joystick** function block enables to activate or deactivate the joystick mode with the control units which have a joystick (hardware) or simulation of the joystick mode for the selected control unit without joystick (software).



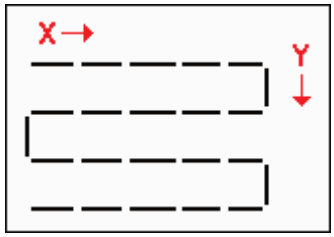
Text box **Current state** - display joystick status.
With the **Joystick on** button you activate the joystick mode. If the control is grayed out, this function is not possible at present.
With the **Joystick off** button you deactivate the joystick mode. If the control is grayed out, this function is not possible at present.

Check box **…XY axes…** - activate simulation of the joystick mode.
Combo box **Control unit** - select control unit (see chapter 3.3).
If the option is not selected, the joystick mode with the control units which have a joystick is activated. If the option is selected, a simulation of the joystick mode for the selected control unit is activated. The simulation uses the configuration of the joystick axes: assignment and velocity for joystick mode (see chapter 3.4). During the joystick mode simulation the velocity mode is started. With the arrow keys (left, right) pressed the axis X is moved. With the arrow keys (up, down) pressed the axis Y is moved. When one of these keys is pressed the maximum joystick velocity is used. When the key is released the velocity value is reduced to zero (movement is finished). A joystick axis without assignment cannot be moved. The axis X is always active with PS 10 (PS 10-32). Therefore axis X belongs to master during the joystick simulation, axis Y – slave1.

4.2 Meander

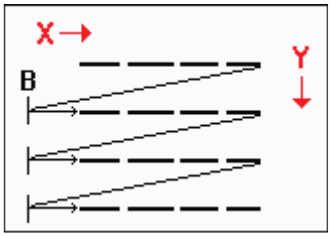
Within the **Meander** work area, you may implement a meander-like movement with any 2 or 3 axes of the connected control units. Optionally, you have the possibility to handle the meander positions manually (**Forward**, **Backward** buttons) or automatically. With the last version, the software halts at every position for the defined time or waits until function is done. The control is axis-based and applies to all connected control units.
Meander travel means that all coordinates of a two-dimensional pattern or of a three-dimensional grid are reached once. Two meander versions are available, “standard” and “unidirectional”. Short description of the two versions as follows:

Standard:

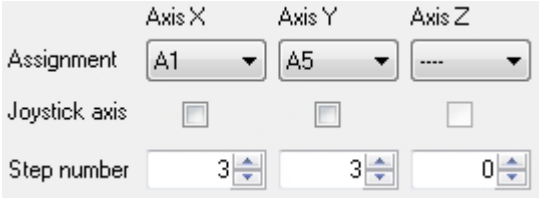


- The X axis moves one step and stops then. This will be repeated until the X sequence is completed, i.e. until the desired number of steps is reached.
- The Y axis moves one step ahead.
- The X axis performs the X sequence backwards.
- The Y axis moves one step ahead.
- The X axis performs the X sequence ahead.
- etc.
- When the Y axis finished the last step, and the X axis completed its last backward or forward sequence, the Z axis moves the first step forwards.
- The next sequence of the X axis starts.
- The Y axis moves one step backwards.
- etc.

Unidirectional:



- The X axis moves one step and stops then. This will be repeated until the X sequence is completed, i.e. until the desired number of steps is reached.
- The Y axis moves one step ahead.
- At the same time, the X axis is going to the origin coordinate. If the B value (backlash compensation distance) has been set to a different value than zero, the motion target will be the (-B) coordinate, instead. Afterwards, the axis turns back and returns to the origin coordinate out of negative direction.
- The X axis performs the X sequence forwards.
- The Y axis moves one step ahead.
- etc.
- When the Y axis has executed the last step, and the X axis completed its last forward sequence, the Z axis moves the first step forwards.
- At the same time, the X axis is going to the origin, or to the (-B) coordinate and finally to the origin. At the same time, the Y axis starts its motion to the origin.
- The X axis performs the X sequence forwards.
- The Y axis moves one step ahead.
- etc.

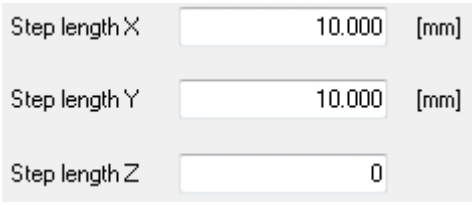


Combo box **Assignment** - select axis.
The control contains the axes (axis identifiers) defined for the connected control units. In order to use the meander axis, please select an axis. For a deactivated axis please select the line "----".

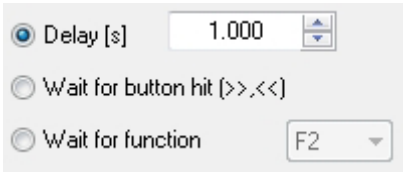
! It is not possible to define identical axes as different meander axes. For example, the axis with the identifier "A1" is defined as X axis. If you try to select this axis ("A1") as Y axis, there is a new assignment and the old one will be deleted (the line "----" is displayed in combo box for the X axis).

Check box **Joystick axis** - select axis for joystick mode.
If the axis is defined, you can drive it in the joystick mode (see below **Activate joystick**... check box). If the control is grayed out, the selected control unit does not have a joystick. Activating the joystick mode for an axis will change the joystick configuration. The meander axis X is defined as joystick axis X for the corresponding control unit, the meander axis Y as joystick axis Y, the meander axis Z as joystick axis Z. If the joystick mode only applies for two axes (SMS 60 and DC 500), it might happen that when activating the Z axis you deactivate the X one (both axes belonging to the same control unit). You are more flexible when using the **Joystick control** dialog box.

Text box with spin button **Step number** - select number of steps for each meander axis.



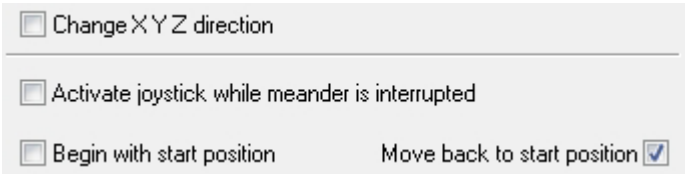
Text box **Step length...** - select step length for each meander axis.
Only the positive values are expected. The measuring unit is the same as for the position output of the assigned axis. A double click on the measuring unit calculates the new step length from the measured or defined stage travel and the defined step number.



Radio button **Delay** - automatically drive to meander positions.
Text box with spin button **Delay [s]** - define break time for meander positions.
The data applies only to the first version (automatic).

Radio button **Wait for button hit…** - manually drive to meander positions.

Radio button **Wait for function** - automatically drive to meander positions.
If this option is activated, a function after reaching the meander position is executed. The meander is continued if the function executing was completed. The function is assigned to a function key (combo box). The functions and the names of the keys can be customized in the **Function keys** dialog box. If no function is assigned to the selected function key, the meander positions will be executed without break.
There are two function types: Macro function and Application function.
If the first type is selected, the defined commands from the program script are executed line-by-line. The function executing was completed if the last line was executed.
If the second type is selected, the predefined application is executed. The function executing was completed if the application was closed.


Change X Y Z direction
Activate joystick while meander is interrupted
Begin with start position
Move back to start position

Check box **Change X Y Z direction** - reverse direction of meander axes.
Thus, a reversed meander travel is possible (all axes move in opposite direction).

Check box **Activate joystick**... - activate joystick mode.
If this option is activated, the joystick mode is switched on with all connected control units, when meander was interrupted (**Break meander** button). Afterwards, the current position of an active joystick axis can be corrected by joystick.

Check box **Begin with start**... - drive to start position as the first meander position.
If the option is activated, the axes are driven to the start position at first (automatic version). For unidirectional meander the backlash compensation of the axis X will be carried out (B > 0).

Check box **Move back to start**... - drive back to start position.
If the option is activated, the axes are driven back to the start position after completion of the meander (automatic version).

Text box **Position B** - define position B.
Only positive values are expected. Their measuring unit is identical to the unit of the X axis. For the distance B we recommend a value, which is at least order of magnitude (factor 10) higher than the maximum backlash. Example: backlash of ± 0.5 µm, e.g. means B ≥ 10 µm.

! Note: Backlash compensation and unidirectional travel are only possible with the X axis.

Using the **Start meander** button you can start the meander for the selected axes. Within the automatic processing (**Delay** and **Wait for function** radio buttons) the meander positions defined will be approached once. Within the manual processing (**Wait for button hit** radio button) the **Forward** and **Backward** buttons are activated. If the program is in the first or the last position of the meander, the **Forward** or **Backward** button is deactivated. With this version, the meander positions can be approached several times. The axes on one control unit (PS 90) will be started synchronously.
Clicking the **Forward** button you can move to the next meander position.
Clicking the **Backward** button you can move to the previous meander position.
Please note that the dual position-control loop of an axis remains active in the positioning mode 2,3,7,9 (see **Axis parameters** dialog box, Dual position-control loop), if the position is reached (phase 3 active, magenta colour). In this state only a further positioning with a dual position-control loop is possible. With the **Stop meander** button the phase 3 can be finished. If a meander process execution is interrupted with the option “Activate joystick…”, the phase 3 is finished.

Press the **Break meander** button in order to interrupt meander process execution. The active positioning will not be stopped; the current target positions will be reached. If required, the joystick mode is activated. The button label changes to **Continue meander**. Next click on the button deactivates the joystick mode, and the meander will be continued (starting from that position where it was interrupted).
Press the **Stop meander** button in order to stop the meander process execution. The axes are stopped. The **Start meander** button is activated and the other buttons are deactivated.

The meander configuration can be saved into a text file with the extension "owm". You have the following menu commands for that (**File** menu):

New

Keys **Ctrl+N**.
Opens a new meander configuration. The meander parameters are set to default. The axis assignment is deleted.

Open

Keys **Ctrl+O**.
Opens an existing configuration file for meander. The corresponding controls are updated.

Save

Keys **Ctrl+S**.
Saves the meander configuration into the existing configuration file. The assignment of the axes is not saved.

Save as

Saves and names the meander configuration file.

4.3 Chain

Using the **Chain** work area, you can define and execute simple movements (coordinate tables).

The controls resemble those of the **Meander** work area. The chain function is an extended, universal version of the meander function. It enables you to define any sequence of target coordinates for driving any axis you desire. Additionally, you can read out positions captured by means of joystick (so-called “teach-in”) by clicking to store them as table values. Optionally, you have the possibility to determine the chain positions for the positioning and to execute them manually (**Forward**, **Backward** buttons) or automatically. With the last version, the software halts at every position for the defined time or waits until function is done. If a table column does not have a title (no assigned axis), this column is ignored when executing the coordinate table. This also applies to cells without contents.
The control is axis-based and applies to all connected control units.

Nr.	A1	A5	X1	Y2
1	20.000	20.000	40.000	40.000
2	17.000	17.000	34.000	34.000
3	8.000	8.000	16.000	16.000

The chain is defined as an ActiveX control, having a table format. In the first row of the table (heading line) you find the axis identifiers for all defined axes. These headings are updated every time you change the axis definition. In the first column of the table you find the coordinate set numbers, from 1 to maximum. The row number can be changed.
Several functions for editing and navigating in the table are available. There are two operating modes: Read mode and Editing mode. In the read mode you can edit the whole table, in the editing mode only the selected table cell.

Editing mode.
In order to activate this mode, please select a cell; confirm the selection by double clicking or by pressing the Enter key. You can also enter the value directly. The colour of the cell changes to white and its contents are marked. Now you can handle the cell like a text field. If you press the Enter key again, you will leave the editing mode. The color of the cell changes and its contents are displayed as formatted. Their format is the same as the one of the position outputs for the assigned axis. If no axes have been assigned, the output is unformatted. You can also leave this mode by pressing the Page Up and Page Down keys. Using the Tab key you can rapidly handle several cells in the editing mode. Having activated the editing mode you enter the new value, e.g. pressing the Tab key, you add the new value and activate the editing mode for the next cell at the same time.

Read mode.
If the editing mode is not activated, the table is in read mode. You can navigate in the table and edit the selected (marked) cells. You can select the desired position (cell) with the mouse. You can, of course, use the keyboard as well:
Right arrow key

Go to next table column.
Left arrow key

Go to previous table column.
Down arrow key

Go to next table row.
Up arrow key

Go to previous table row.
Home key

Go to first table column.

End key
Go to last table column.
Page Down key
Go to last table row.
Page Up key
Go to first table row.
Tab key
Go to next table cell. If the last table cell is reached, the first cell will be selected.

You can also select (mark) more than one cell using the keyboard or the mouse. The left upper table cell of the selection is interpreted as reference cell. In the selected cells the sign can be changed (reversed) with keyboard (Minus key). To edit the marked table selection, the following menu commands are available (**Edit** menu):

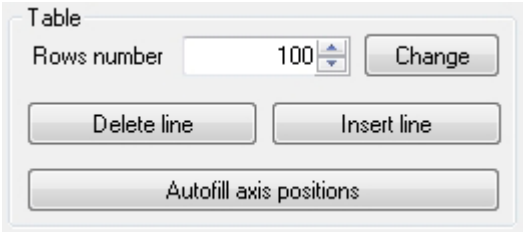
Cut
Keys **Ctrl+X**.
Removes the selected data in the control (table) and moves it to the clipboard.

Copy
Keys **Ctrl+C**.
Copies the selected data in the control (table) to the clipboard.

Paste
Keys **Ctrl+V**.
Inserts a copy of the clipboard contents at the marked table cell. The cell contents are substituted with the contents of the reference cell. Besides, the lower cells, which correspond to the before marked table area, are overwritten. The multiple cell contents can be also inserted, if the target range is larger than source range (like Excel).

Clear
Key **Del**
Removes the selected data in the control (table).

An Excel worksheet can be copied similarly. Please start the Excel application and load the desired worksheet. Mark the desired range of cells and copy them to the clipboard. Afterwards, activate the **OWISoft** window (or start application). Then select the desired table cell and insert the contents of the clipboard. To separate integer and fractional digits, the decimal point is valid only. When transferring the data, all commas are replaced by points.

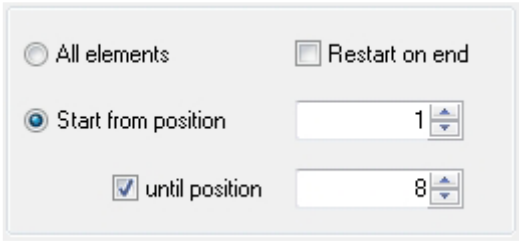


Text box with spin button **Rows number** - select number of table rows.
Using the **Change** button you can set the new value and the table will grow or shrink (number of rows only!). Values from 1 to 26922 are possible. The number of columns is constant. If a column does not have any heading (no axis assigned), it will be ignored during the execution of the coordinate table. This applies also to the cells without contents.

Press the **Delete line** button in order to delete the selected line (contents of the selected table row). The contents of lower table rows are shifted upward.
Press the **Insert line** button in order to insert an empty line (cells without contents) before the selected table row. The contents of lower table rows are shifted downward. The contents of the last table row are deleted.
With the **Autofill axis positions** button the selected table cells (chain positions) are automatically filled (options for selecting). Besides, the measured stage travel or an entered value is used as the whole way.

Use the **Joystick...** button in order to switch the joystick mode on or off for all connected control units. This button works like a check box. The button state and the heading indicate whether the joystick mode is switched on or off. If the joystick is active, you can drive to any desired position.

With the **Read position values** button you can transfer the actual axes positions from the joystick mode into the table. This applies only to the joystick axes (coloured marks), when joystick mode is activated. When joystick mode is not activated, the positions of all defined axes are read out. For the axes with a dual position-control loop the position of the way measuring system of an axis is read out.



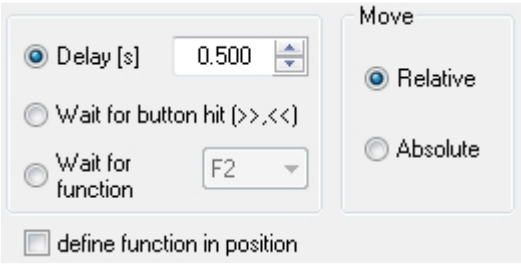
Radio button **All elements** - execute coordinate table (all positions).
If the option is selected, the chain is executed sequentially from the first to the last line.

Radio button **Start from position** - execute coordinate table (selected positions).
Text box with spin button **...from position** - select start line.
If this option is selected, the chain is executed beginning from this line.

Check box **until position** - activate end line monitoring.
Text box with spin button **until position** - select end line.
If the monitoring is active, the chain is processed up to the defined end line. This applies only to the second version (executing of the selected positions). If the control is not activated, the chain is executed up to the last line.

Check box **Restart on end** - activate continuous chain execution.
If the option is active, the chain is executed as a loop. If the last position is reached, the execution of the chain continues with the first line etc.

! Continuous execution is possible with an automatic chain only.



Radio button **Delay** - execute chain positions automatically.
Text box with spin button **Delay [s]** - define break time for chain position.
This value applies only to automatic chain execution.

Radio button **Wait for button hit…** - execute chain positions manually.

Radio button **Wait for function** - execute chain positions automatically.
If this option is activated, a function after reaching the chain position is executed. The chain execution will be continued if the function executing was completed. The function is assigned to a function key (combo box). The functions and the names of the keys can be customized in the **Function keys** dialog box. If no application is assigned to the selected function key, the chain positions are reached without break.

There are two function types: Macro function and Application function.
If the first type is selected, the defined commands from the program script are executed line-by-line. The function executing was completed if the last line was executed.
If the second type is selected, the predefined application is executed. The function executing was completed if the application was closed.

Check box **...function in position** - activate function in position.
If this option is activated, the function (or break time) is defined in every chain position (configuration for every line). If this option is deactivated, the function (or break time) is defined for selected chain positions (configuration for all lines).

Function in position
The break time values (option "Delay…") for selected chain positions are displayed (as decimal value in ms) in the next empty column (no assigned axis). The functions (option "Wait for function") for selected chain positions are displayed (assigned to a function key) in the next empty column with caption "Function". In the editing mode the time value can be changed. In the editing mode any function key can be selected (combo box).

Radio button **Relative** - relative move to the chain positions.
The table values are interpreted as distance for the corresponding axes.
Radio button **Absolute** - absolute move to the chain positions.
The table values are interpreted as target position for the corresponding axes.

Output in position
2 commands from the program script (AninToTab, FileValueToTab) are only used for the **Chain** work area (...ToTab). With this the value of an analog input or the value from a text file can be displayed in the next empty column (no assigned axis). It is possible, to request several values successively. The ActiveX control for the chain (table) has only 12 columns. Please note that data output is possible if the empty columns are available.

Press the **Start chain** button in order to execute the chain for the defined axes. With automatic execution (**Delay** and **Wait for function** radio buttons), the chain positions can be reached once or several times (continuous chain executing is activated), namely downwards. If the positions of the current line were reached, the program waits for the desired time or until function is done. With manual execution (**Wait for button hit** radio button), the **Forward** and **Backward** buttons are activated. If the application reaches the first or the last chain position, the **Backward** or **Forward** button is deactivated. Using this version you can execute the chain positions as often as required. The **Restart on end** option is not applicable then. The axes on one control unit (PS 90) will be started synchronously.
Press the **Forward** button in order to drive to next chain positions (next line).
Press the **Backward** button in order to drive to previous chain positions (previous line).
Please note that the dual position-control loop of an axis remains active in the positioning mode 2,3,7,9 (see **Axis parameters** dialog box, Dual position-control loop), if the position is reached (phase 3 active, magenta colour). In this state only a further positioning with a dual position-control loop is possible. With the **Stop chain** button the phase 3 can be finished. If the joystick mode is activated with the **Joystick**... button, the phase 3 is finished.

Press the **Break chain** button in order to interrupt the execution of the chain. The positioning will not be stopped and the current target positions will be reached. The button label changes to **Continue chain**. Next click on the button continues the chain execution (starting from that position where it was interrupted).
Press the **Stop chain** button in order to stop the chain execution. The axes are stopped. The **Start chain** button will be activated and the other buttons deactivated.

The configuration of the chain (coordinate table) can be saved into a text file with the extension "owc". You have the following menu commands for that (**File** menu):
New
Keys **Ctrl+N**.
Opens a new empty coordinate table.
Open
Keys **Ctrl+O**.
Opens an existing configuration file for the chain. The table values are updated.

Save

Keys **Ctrl+S**.

Saves the coordinate table into the existing configuration file. The assignment of the axes is not saved.

Save as

Saves and names the configuration file.

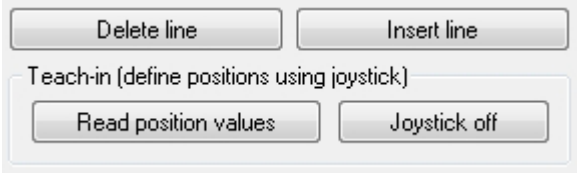
Export / import data

Saves or loads the data in CSV format. The separator and the decimal separator are adjustable. With the saving of the coordinate table the allocation of the axes is not saved. After the data import the table values are updated.

4.4 Program

4.4.1 Front-end

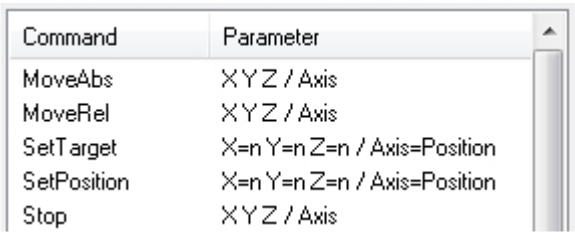
The **Program** work area enables you to define complex movements, to store them as a program script and execute them later. Thus, loops and even computations are possible to a certain extent. With the program script you can extend possibilities of the application and automate certain sequences. A small universal (applicable for all control unit types) script language is used. The script is edited in a text editor, on the left side of the tab panel. The script language consists of 46 commands. Short command descriptions can be found as follows.
The control is axis-based and applies to all connected control units.



The **Delete line** button erases the selected editor line. The lower lines are shifted upward.
With the **Insert line** button you can insert an empty line before the active editor line. The lines below are shifted downward.

Use the **Joystick...** button in order to switch the joystick mode on or off for all connected control units. This button works like a check box. The button state and the label indicate whether the joystick mode is switched on or off. If the joystick is active, you can drive to any defined position.

With the **Read position values** button you can transfer the positions from the joystick mode into the selected editor line. The positions are converted to the “SetTarget” command, for example, “SetTarget X=0 Y=0 Z=0”. When joystick mode is activated, it applies only to the joystick axes. If the joystick mode is not activated, the positions of all defined axes are read out. For the axes with a dual position-control loop the position of the way measuring system of an axis is read out.



You can enter all commands with the appropriate parameters through keyboard. You can place only one command within a line. That command has to be in the first position. The command line may consist of 15 elements (words) maximally. They are separated by blanks or tabulators, except the “MessageBox...” commands. They expect a message string as a first parameter, which has to be enclosed in inverted commas ('...' or “...”). The message string is interpreted as an element and can consist of several words.

! Commands not having valid parameters are not executed. Using the “Loop” and “WaitForAxisStop” commands, it is possible, e.g. to cancel single program blocks. Without valid parameters the loop command is ignored. The program block located in such a loop is “commented out” in the program virtually.

There is another possibility of entering commands into the text editor. All commands of the script language including a short description are listed in the command list. Click in the appropriate line to transfer the command into the editor and replace the marking. Afterwards, you should enter the appropriate parameters manually.
To edit on the marked text in the editor, please use following menu commands (**Edit** menu):

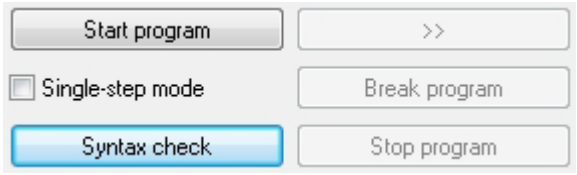
Cut
Keys **Ctrl+X**.
Removes the marking (selection) in the text editor and puts it on the clipboard.

Copy
Keys **Ctrl+C**.
Copies the marking (selection) in the text editor to the clipboard.

Paste
Keys **Ctrl+V**.
Removes the marking (selection) in the text editor and inserts a copy of the clipboard contents at the insertion point.

Clear
Key **Del**
Removes the marking (selection) in the text editor.

If the program script has been created, you can test or execute it. Optionally, you have the possibility to execute the program or to test the program sequentially (line by line).



Check box **Single-step mode** - activate sequential program execution.

Press the **Start program** button to start the program. When processing automatically (**Single-step mode** option is not active), the program lines are executed top down. The active line is marked. When processing sequentially (**Single-step mode** option is active), the **Forward** button is activated. When the last program line was executed, the program will be finished.
Press the **Forward** button in order to execute the next program line.
Please note that the dual position-control loop of an axis remains active in the positioning mode 2,3,7,9 (see **Axis parameters** dialog box, Dual position-control loop), if the position is reached (phase 3 active, magenta colour). In this state only a further positioning with a dual position-control loop is possible. To use another positioning type (e.g., reference run), you can break the dual position-control loop with the Stop command from the script or with the **Stop program** button. If the joystick mode is activated with the **Joystick**... button, the phase 3 is finished.

With the **Break program** button you halt the program execution. The positioning will not be stopped and the current target positions will be reached. The button label is changed to **Continue program**. Next click on the button continues the program execution (from that position where it was interrupted).

Press the **Stop program** button in order to terminate the program execution. The axes are stopped. The key **Start program** will be activated and the other buttons deactivated.

Using the **Check syntax** button, you start checking the command syntax and command parameters. Only the program script will be checked, no positioning will be started and no axis parameters will be changed. When automatically processing (**Single-step mode** option is not active), the program lines are checked top down. The current line is marked. If an error is found, the execution will be interrupted. Afterwards, the error position is marked and a dialog box is opened, which displays the line and the position of the error. Press the **Continue program** button in order to continue the check. At the end an error log is displayed, which contains all the errors found.

During the sequential processing (**Single-step mode** option is active) the **Forward** button is activated. If the last program line was processed, the check is completed. When using the **Forward** button, the next program line is executed. After each line an error log is indicated, which displays the line and the position of the error. The error position is marked.

! We recommend checking the new program first before you use it. Only the syntax and the defined parameters (primarily the axis identifiers) are tested. The software cannot check the logical structure of the program.

Notes:

- Speeds and accelerations can be changed during the program execution (restriction SMS 60 and DC 500: changing is possible only for axes, which are not in motion, actually).
- If procedures or variables are used in the program script, they should be defined previously in the program (for example, first "Proc xyz...", then "Call xyz").
- Program loops can be nested up to five levels.

For more information see command descriptions.

The program script can be stored into a text file with the extension "owp".
Following menu commands are available for it (**File** menu):

New

Keys **Ctrl+N**.
Opens a new empty script. The contents of the text editor are deleted.

Open

Keys **Ctrl+O**.
Opens an existing program script. The contents of the text editor are updated.

Save

Keys **Ctrl+S**.
Saves a program script into an existing text file.

Save as

Saves and names a program script file.

4.4.2 Command definition

MoveAbs

Description

Absolute positioning. Please first define the target position, if necessary (see **SetTarget**). The target mode is set to absolute. The axes on one control unit (PS 90) will be started synchronously.

Parameters

Axis identifiers are expected as parameters (min. 1, max. 12 identifiers, separated from each other by blanks or tabulators). Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed.

Syntax

MoveAbs <identifier 1> <identifier 2> ...

MoveRel

Description

Relative positioning. Please first define the distance, if necessary (see **SetTarget**). The target mode is set to relative. The axes on one control unit (PS 90) will be started synchronously.

Parameters

Axis identifiers are expected as parameters (min. 1, max. 12 identifiers, separated from each other by blanks or tabulators). Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed.

Syntax

MoveRel <identifier 1> <identifier 2> ...

SetTarget

Description

Define target position or distance. The target mode is set to absolute. After that an axis can be started (see **MoveAbs**, **MoveRel**).

Parameters
Axis identifiers and position value (as a constant) are expected as parameters, separated by an equal sign. Instead of a position value you can use a variable by indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
SetTarget <axis 1>=<constant 1>...
or
SetTarget <axis 1>=<variable 1>...

SetPosition
Description
Set actual position of the axis counter.
Parameters
Axis identifiers and position value (as a constant) are expected as parameters, separated by an equal sign. Instead of a position value you can use a variable by indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
SetPosition <axis 1>=<constant 1>...
or
SetPosition <axis 1>=<variable 1>...

Stop
Description
Stop the selected axis.
Parameters
Axis identifiers are expected as parameters (min. 1, max. 12 identifiers, separated from each other by blanks or tabulators). Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed.
Syntax
Stop <identifier 1> <identifier 2> ...

Loop ... EndLoop
Description
Possibility to generate repeated sequences by using a “loop”. The **Loop** command necessarily needs the completion by means of **EndLoop**. Herewith, the “loop” program block is completed.
Parameters
A number of the loops (number of repetitions) is expected as parameter. The program block included in the loop is executed accordingly then, one loop after the other. If no valid parameters are set, the loop is ignored. The program block located in such a loop is “commented out” in the program virtually.
Syntax
Loop <loop number>
...
EndLoop

WaitForAxisStop ... EndWait
Description
Possibility to generate repeated sequences by using a “WaitForAxisStop” loop. This is a conditioned loop, which is executed until the condition is fulfilled. The condition is that the positioning of the selected axes is completed (axes are in position). The **WaitForAxisStop** command necessarily needs the completion by means of **EndWait**. Herewith, the program block “wait” is completed.
Parameters
Axis identifiers are expected as parameters (min. 1, max. 12 identifiers, separated from

each other by blanks or tabulators). Incorrect identifiers are ignored. If no valid parameters are set, the loop is ignored. The program block located in such a loop is “commented out” in the program virtually.
Syntax
WaitForAxisStop <identifier 1> <identifier 2> ...
...
EndWait

Delay
Description
Define delay.
Parameters
As parameter you need a number which defines the delay in milliseconds. If no valid parameters are set, the command is not executed.
Syntax
Delay <delay>

Proc ... EndProc
Description
Possibility to define program blocks once written as procedure, so that they can be used several times in different places. The **Proc** command necessarily needs to be ended by using **EndProc**. Herewith, the program block “proc” is completed.
Parameters
As parameter you need a procedure name. Procedures having the same name are not possible. If no valid parameters are set, the procedure is ignored. The program block located in such a procedure is “commented out” in the program virtually.
Syntax
A procedure name may be as long as required and can consist of alphanumeric characters. Separators such as blanks or tabulators are not allowed.
Proc <procedure_name>
...
EndProc

Call
Description
Calls a procedure already defined before in the program code.
Parameters
As parameter you need a valid, i.e. already defined procedure name. If no valid parameter is set, the command is not executed.
Syntax
Call <procedure_name>

Var
Description
Definition of a variable of the type “double” and assignment of a constant or of a variable to this variable.
Parameters
As first parameter you need a valid variable name. As second parameter you need a valid variable name or a constant. If there are no valid parameters set, there is no action.
Syntax
A variable name may be as long as required and can consist of alphanumeric characters. Separators such as blanks or tabulators are not allowed. As first character you must choose a letter.
Var <identifier 1> <identifier 2>
In this case: <identifier 1> = <identifier 2>

! Note: When evaluating the parameters **OWISoft** checks at first, whether a variable with the corresponding name is available (variable has priority before constant). For example, if a variable with the name "12b" has been defined, **OWISoft** interprets it as the numeric constant 12 and not as a variable with the name "12b".

Add
Description
Addition of a constant or of a variable to a variable.
Parameters
Two valid variable names (see **Var**), or a valid variable name (identifier 1) and a constant (identifier 2) are needed. There is no action, if no valid parameters are set.

Syntax
Add <identifier 1> <identifier 2>
In this case: <identifier 1> = <identifier 1> + <identifier 2>

Sub
Description
Subtraction of a constant or of a variable from a variable.
Parameters
Two valid variable names (see **Var**), or a valid variable name (identifier 1) and a constant (identifier 2) are needed. There is no action, if no valid parameters are set.
Syntax
Sub <identifier 1> <identifier 2>
In this case: <identifier 1> = <identifier 1> - <identifier 2>

Mul
Description
Multiplication of a variable with a constant or a variable.
Parameters
Two valid variable names (see **Var**), or a valid variable name (identifier 1) and a constant (identifier 2) are needed. There is no action, if no valid parameters are set.
Syntax
Mul <identifier 1> <identifier 2>
*In this case: <identifier 1> = <identifier 1> * <identifier 2>*

Let
Description
Assignment of a constant or a variable to a variable.
Parameters
Two valid variable names (see **Var**), or a valid variable name (identifier 1) and a constant (identifier 2) are needed. There is no action, if no valid parameters are set.
Syntax
Let <identifier 1> <identifier 2>
In this case: <identifier 1> = <identifier 2>

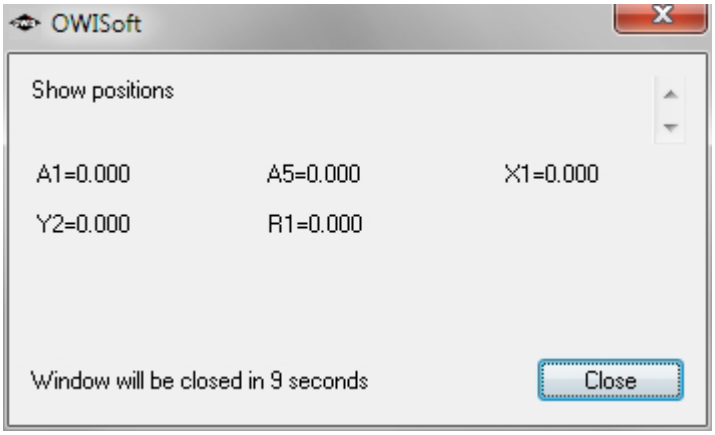
SetVel
Description
Set axis positioning velocity.
Parameters
Axis identifier and velocity value (as a constant) are expected as parameters, separated by an equal sign. Instead of a speed value you can use a variable by indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
SetVel <axis 1>=<constant 1>...
or
SetVel <axis 1>=<variable 1>...

SetAccel
Description
Set axis acceleration.
Parameters
Axis identifier and acceleration value (as a constant) are expected as parameters, separated by an equal sign. Instead of an acceleration value you can use a variable by

indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
SetAccel <axis 1>=<constant 1>...
or
SetAccel <axis 1>=<variable 1>...

MessageBox
Description
Displays a dialog box and interrupts program, until the user closes the window, for example, by mouse click.
Parameters
As first parameter, the message string is set. It has to be placed in inverted commas ('...' or "..."). Optionally, the axis identifiers can be set (min. 1, max. 12 identifiers, separated by blanks or tabulators from each other). The corresponding axis position is additionally displayed in the dialog box. Incorrect identifiers are ignored. If no valid parameters are set, an empty dialog box is displayed.
Syntax
MessageBox <"message"> <identifier 1>...

MessageBoxDelay
Description
The functionality is similar to that of the **MessageBox** command. Displays a dialog box and interrupts a program for the time set as additional parameter in seconds, or until the user closes the window by mouse click.



Parameters
As first parameter you set the interruption time in seconds, afterwards the message string, which must be included in inverted commas. Optionally, you can set axis identifiers (min. 1, max. 12 identifiers, separated by blanks or tabulators from each other). The corresponding axis position is additionally displayed in the dialog window. Incorrect identifiers are ignored. If no valid parameters are set, an empty dialog box is displayed. If the time value is null, this command is interpreted just like the **MessageBox** command.
Syntax
MessageBoxDelay <delay> <"message"> <identifier 1>...

! Note: The dialog box can be closed anytime, for example, by mouse click, even if the defined interruption time is not elapsed yet.

Beep
Description
Produces beep (ASCII: "BEL").
Parameters
No parameters are needed.
Syntax
Beep

JoystickOn
Description
Switches on joystick mode.
Parameters
No parameters are needed.
Syntax
JoystickOn

JoystickOff
Description
Switches off joystick mode.
Parameters
No parameters are needed.
Syntax
JoystickOff

Rem
Description
Comments out a program script line.
Parameters
No parameters are needed. To exclude a program script line from the execution, put this command before this line.
Syntax
Rem <out-commented script line>

ExecWait
Description
Executes an external program. The running script is interrupted until the user terminates this application.
Parameters
A valid file path is expected as parameter. This file is executed (an application) or opened with the suitable program. An application can be started with parameters (command-line, ShellExec or cmd.exe). You can define software installed under Windows by its name (without path information), for example, “excel”. Alternatively, you may enter the name of a function key. The external program assigned to this key is executed (file is opened).
If no valid parameter is set, an error message is displayed.
Syntax
ExecWait <program name or path> + [parameters]
ExecWait notepad “D:\Temp\my test\test.txt”
ExecWait “D:\Temp\my test\mytool.exe” 5 50000 0
ExecWait F2
ExecWait E:\chart.vi

WaitForInput
Description
Checks a digital input until a predefined state appears or the timeout is expired (only for PS 90, PS 30, PS 35, PS 10).
Parameters
As first parameter you set an axis identifier. The control unit which digital input is checked is exactly defined by an axis identifier. An input number (1-16) and a state value (0 – low, 1 – high) are expected as second parameter, separated by an equal sign. As third parameter you can set a timeout value in ms. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed. If the timeout value is smaller than 1 or empty, a digital input is checked only once. If the string “max” is given for the timeout, a digital input is checked without time restriction (endless loop). Press the **Stop program** button in order to terminate the check loop and the program script execution. A short description of inputs and outputs can be found in chapter 3.11.
Syntax
WaitForInput <identifier> <input>=<state> <timeout>

SetPTrigger
Description
Set a digital output to high, reset it after a predefined delay to low (only for PS 90, PS 30, PS 35, PS 10).
Parameters
As first parameter you set an axis identifier. The control unit which digital output is set is exactly defined by an axis identifier. An output number (1-16) is expected as second parameter. As third parameter you can set a delay value in ms. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed. If the delay value is smaller than 1 or empty, a digital output is not reset. A short description of inputs and outputs can be found in chapter 3.11.
Syntax
SetPTrigger <identifier> <output> <delay>

SetNTrigger
Description
Set a digital output to low, reset it after a predefined delay to high (only for PS 90, PS 30, PS 35, PS 10).
Parameters
As first parameter you set an axis identifier. The control unit which digital output is set is exactly defined by an axis identifier. An output number (1-16) is expected as second parameter. As third parameter you can set a delay value in ms. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed. If the delay value is smaller than 1 or empty, a digital output is not reset. A short description of inputs and outputs can be found in chapter 3.11.
Syntax
SetNTrigger <identifier> <output> <delay>

PosToVar
Description
Read actual position of the axis counter and saves to the defined variable.
Parameters
Variables and axis identifiers are expected as parameters, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
PosToVar <variable 1>=<axis 1>...

GoVel
Description
Set target velocity of an axis for velocity mode, after that starts velocity mode (only for PS 90, PS 30, PS 35, PS 10). The axes on one control unit (PS 90) will be started synchronously.
Parameters
Axis identifier and velocity value (as a constant) are expected as parameters, separated by an equal sign. Instead of a speed value you can use a variable by indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
GoVel <axis 1>=<constant 1>...
or
GoVel <axis 1>=<variable 1>...

SetMem
Description
Set value of a memory marker (1 byte) of the control unit. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is set is exactly defined by an axis identifier. A memory index and a value of the memory

marker (0-255) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
SetMem <identifier> <memory index>=<constant>
or
SetMem <identifier> <memory index>=<variable>

SetMem16
Description
Set value of a memory marker (2 bytes = 16 bits) of the control unit. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is set is exactly defined by an axis identifier. A memory index and a value of the memory marker (-32768...32767) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
SetMem16 <identifier> <memory index>=<constant>
or
SetMem16 <identifier> <memory index>=<variable>

SetMem32
Description
Set value of a memory marker (4 bytes = 32 bits) of the control unit. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is set is exactly defined by an axis identifier. A memory index and a value of the memory marker (-2147483648...2147483647) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
SetMem32 <identifier> <memory index>=<constant>
or
SetMem32 <identifier> <memory index>=<variable>

WaitForMem
Description
Checks value of a memory marker (1 byte) until a predefined state (value) appears or the timeout is expired. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A memory index and a value of the memory marker (0-255) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name, so that its value will be taken. As third parameter you can set a timeout value in ms. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If the timeout value is smaller than 1 or empty, a digital input is checked only once. If the string “max” is given for the timeout, a digital input is checked without time restriction (endless loop). Press the **Stop program** button in order to terminate the check loop and the program script execution. If no valid parameters are set, the command is not executed.

Syntax
WaitForMem <identifier> <memory index>=<constant> <timeout>
or
WaitForMem <identifier> <memory index>=<variable> <timeout>

WaitForMem16
Description
Checks value of a memory marker (2 bytes = 16 bits) until a predefined state (value) appears or the timeout is expired. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A memory index and a value of the memory marker (-32768...32767) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name, so that its value will be taken. As third parameter you can set a timeout value in ms. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If the timeout value is smaller than 1 or empty, a digital input is checked only once. If the string “max” is given for the timeout, a digital input is checked without time restriction (endless loop). Press the **Stop program** button in order to terminate the check loop and the program script execution. If no valid parameters are set, the command is not executed.
Syntax
WaitForMem16 <identifier> <memory index>=<constant> <timeout>
or
WaitForMem16 <identifier> <memory index>=<variable> <timeout>

WaitForMem32
Description
Checks value of a memory marker (4 bytes = 32 bits) until a predefined state (value) appears or the timeout is expired. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A memory index and a value of the memory marker (-2147483648...2147483647) are expected as second parameter, separated by an equal sign. Instead of a value you can use a variable by indicating its name, so that its value will be taken. As third parameter you can set a timeout value in ms. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If the timeout value is smaller than 1 or empty, a digital input is checked only once. If the string “max” is given for the timeout, a digital input is checked without time restriction (endless loop). Press the **Stop program** button in order to terminate the check loop and the program script execution. If no valid parameters are set, the command is not executed.
Syntax
WaitForMem32 <identifier> <memory index>=<constant> <timeout>
or
WaitForMem32 <identifier> <memory index>=<variable> <timeout>

MemToVar
Description
Read value of a memory marker (1 byte) and saves to the defined variable. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A valid variable and a memory index are expected as second parameter, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.

Syntax
MemToVar <identifier> <variable>=<memory index>

Mem16ToVar
Description
Read value of a memory marker (2 bytes = 16 bits) and saves to the defined variable. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A valid variable and a memory index are expected as second parameter, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
Mem16ToVar <identifier> <variable>=<memory index>

Mem32ToVar
Description
Read value of a memory marker (4 bytes = 32 bits) and saves to the defined variable. Memory index for PS 90 – 0…511. Memory index for PS 30 and PS 35 – 0…255.
Parameters
As first parameter you set an axis identifier. The control unit which memory marker is checked is exactly defined by an axis identifier. A valid variable and a memory index are expected as second parameter, separated by an equal sign. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). If no valid parameters are set, the command is not executed.
Syntax
Mem32ToVar <identifier> <variable>=<memory index>

MoveAxis
Description
Define target position or distance (optionally). The target mode remains unchanged. After that an axis is started (see **MoveAbs**, **MoveRel**). The axes on one control unit (PS 90) will be started synchronously.
Parameters
Axis identifiers and position value (as a constant) are expected as parameters, separated by an equal sign. Instead of a position value you can use a variable by indicating its name, so that its value will be taken. If the identifier is not correct, this parameter is ignored. If the variable was not found, this parameter is ignored. In order to use a variable, it should be defined first (see **Var**). Without position value (constant) the target position is not redefined. If no valid parameters are set, the command is not executed.
Syntax
MoveAxis <axis 1>=<constant 1>...
or
MoveAxis <axis 1>=<variable 1>...
or
MoveAxis <axis 1>...

AninToTab
Description
Read value of an analog input and shows it in the table, **Chain** work area (only for PS 90, PS 30, PS 35, PS 10).
Parameters
As first parameter you set an axis identifier. The control unit which analog input is read is exactly defined by an axis identifier. An input number (1-8) is expected as second parameter. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed. A short description of inputs and outputs can be found in chapter 3.11.
Syntax
AninToTab <identifier> <input>

AninToFile

Description

Read actual position of the axis counter and value of an analog input and saves to the text (.txt) file (only for PS 90, PS 30, PS 35, PS 10).

Parameters

The name of a function key is expected as first parameter. Thus the file path is defined for data export (Application function of the function key). As the second parameter you set a number (0-6), which determines the output format. Possible formats (separator + decimal separator):

0 – Semicolon + Point,
1 – Tab + Point,
2 – Space + Point,
3 – Comma + Point,
4 – Semicolon + Comma,
5 – Tab + Comma,
6 – Space + Comma.

Axis identifiers and input numbers (1-8) are expected as next parameters, separated by an equal sign (min. 1, max. 12 identifiers, separated from each other by blanks or tabulators). The control unit which analog input is read is exactly defined by an axis identifier. Incorrect identifiers are ignored. If no valid parameters are set, the command is not executed. A short description of inputs and outputs can be found in chapter 3.11.

The file for data export is created (new file) or appended (file exists). First the axis positions are written, then the values of analog inputs.

Example: F2 0 axis1=input1 axis2.

Output: “10.000;20.000;0”.

Syntax

AninToFile F2 <format> <axis 1>=<input 1> <axis 2>=<input 2>...

or

AninToFile F2 <format> <axis 1> <axis 2>...

FileValueToTab

Description

Read value from the text file (CSV format) and shows it in the table, **Chain** work area (only for PS 90, PS 30, PS 35, PS 10).

Parameters

The name of a function key is expected as first parameter. Thus the file path is defined for data export (Application function of the function key). As the second parameter you set a number (0-3), which determines the output format. Possible formats (separator + decimal separator):

0 – Semicolon + Point,
1 – Tab + Point,
2 – Space + Point,
3 – Comma + Point.

The line number in the file is expected as the third parameter. This line in the file corresponds to a dataset; single data fields (columns) are separated by separator. The column (field) number in the file is expected as the fourth parameter. If no valid parameters are set, the command is not executed. If the line is not found in the file, an empty string is indicated. If the column number is too large, the first element in the line is indicated.

Syntax

FileValueToTab F2 <format> <row> <column>

ExecCmd

Description

Sends a direct command to the control unit (only for PS 90, PS 30, PS 35, PS 10). The commands from the command reference of the control unit are used (commands without reply, without “?”).

Parameters

As first parameter you set an axis identifier. The control unit is exactly defined by an axis identifier. The command for the control unit is expected as second parameter. As third parameter you can define a delay value for the communication, in ms. Incorrect identifiers

are ignored. If the delay value is empty, the standard delay is used for the communication. If no valid parameters are set, the script command is not executed.
Syntax
ExecCmd <identifier> <command> <delay>

4.4.3 Sample program

Var Target 0	- define and initialize variable “Target”.
Proc Procedure1	- define procedure “Procedure1”.
SetTarget A1=Target	- set target position for the axis “A1”, the value will be determined through the variable “Target”.
MoveAbs A1	- move axis “A1” absolute to target position.
MessageBoxDelay 2 'Axis A1 runs'	- display dialog box with the message “Axis A1 runs”. It will be closed in 2 seconds.
WaitForAxisStop A1	- wait until axis “A1” reached position.
EndWait	- end of the loop program block.
EndProc	- end of definition of the procedure “Procedure1”.
Proc Procedure2	- define procedure “Procedure2”.
SetTarget A2=Target	- set target position for the axis “A2”, the value will be determined through the variable “Target”.
MoveAbs A2	- move axis “A2” absolute to target position.
Beep	- produce beep.
WaitForAxisStop A2	- wait until axis “A2” reached position.
EndWait	- end of the loop program block.
EndProc	- end of definition of the procedure “Procedure2”.
Proc Procedure3	- define procedure “Procedure3”.
SetTarget z1=Target	- set target position for the axis “z1”, the value will be determined through the variable “Target”.
MoveAbs z1	- move axis “z1” absolute to target position.
Beep	- produce beep.
WaitForAxisStop z1	- wait until axis “z1” reached position.
EndWait	- end of the loop program block.
EndProc	- end of definition of the procedure „Procedure3“.
Loop 5	- repeat 5 times.
Add Target 10	- change variable “Target” (+10).
Call Prozedur1	- call procedure “Procedure1”.
Call Prozedur2	- call procedure “Procedure2”.
Call Prozedur3	- call procedure “Procedure3”.
EndLoop	- end of the loop program block.

4.5 Auxiliary

The **Auxiliary** work area enables the input of direct commands, if necessary with subsequent read-out of a possible answer, in accordance with the respective control unit manual to test purposes. It is possible to communicate directly with a control unit. The commands used for the corresponding control unit are described in the control unit’s command reference.

! Please note that a read command begins with a question mark.

Combo box **Control unit** - select control unit (see chapter 3.3).
Combo box **Command** - enter or select command for the control unit.
The direct inputs are made in the text box. The commands that have been entered earlier are displayed in the list box of this control. For repeating the input, you can select the desired command from the list box.

Press the **Send command** button in order to send the defined string to the selected control unit. The ENTER key has the same effect (keyboard).
Press the **Send command & read string** button in order to send the defined string to the selected control unit and to read out the answer. The key combination (Alt + Enter) has the same effect.

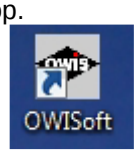
The **Timeout value** text box displays the timeout value (delay in milliseconds) for the communication. The communication is logged in a list box at the bottom of the work area.

5 How to use OWISoft

5.1 Starting the application

After installation you can start the software and put the positioning units into operation.
You have three possibilities to start the application:

- Click the **OWISoft** icon on the desktop.



- Alternatively, click the **OWISoft** menu item in the **Start Programs** menu.
- Or double click on the configuration file with the extension “owi”. You find them in the directory “..\OWISoft\Application\data”.

5.2 Connect control unit

For every working session the desired control unit will be connected with the software. Besides, the following conditions must be fulfilled:

- The control unit is switched on and connected to a PC.
- The positioning units are connected with the control unit.
- The control units DC 500 and SMS 60 will be operated by means of the integrated keyboard (modes 1-9) or through the integrated interface. During manual operating (mode 1-9 activated) the interface is blocked. Please leave the activated mode for the software control. If no mode is selected, the firmware version is shown in the display. The control unit PS 90 will be operated by means of the hand terminal or through the integrated interface. The interface is not blocked by the hand terminal.
- The desired interface is already present in the system (serial, USB or GPIB interface of the National Instruments, configured Ethernet interface). A free connector (“port” or “device address”) is available (PS 90, PS 30, PS 35, PS 10, DC 500 and SMS 60).
- Before to connect the application with the interface, please check the selected values. They should be identical to the control unit settings (control units DC 500 and SMS 60, mode 3, keys “E” and “3”; control unit PS 90, hand terminal “Setup/Serial Interface”). This mode is terminated by pressing the key “E”. One can configure the network interface with the following tools: “Anybus IPconfig” and “PS90 IPconfig” (..\OWISoft\Application\system). “Anybus IPconfig” configures the TCP/IP network settings of an Anybus module (Modbus/TCP). This utility can scan the Ethernet network for connected Anybus products (a control unit with Anybus module). Please note: the settings are lost after a reboot of the control unit. “PS90 IPconfig” configures the TCP/IP network settings of an Anybus module (Modbus/TCP). This utility needs an USB connection for the configuration. Please note: the settings are saved and available after a reboot of the control unit.
- The hardware is built in. The driver is installed. A power supply cable is connected (24V supply for control unit PS 30).

You have two different possibilities to connect a control unit with the application:

1. as a new control unit – **File Control unit New** menu or icon in the toolbar, or
2. as an existing control unit – load the configuration file for a control unit – **File Control unit Open** menu.

Clicking the icon (new control unit) in the toolbar, or using the **File Control unit New** menu you can select (type of control unit) and connect the desired control units. An existing configuration, which has already been saved, can be opened by using the **File Control unit Open** menu. The **Connect** dialog box is opened. If the **Connect automatically at startup** option is activated, the dialog box is not displayed and the connection to the control unit is made in the background. If you want to check or to change the interface configuration for an existing control unit, the control unit must be selected (the active window) and the **Connect** dialog box (**Control Connect** menu) has to be open.

Here an interface configuration will be defined. For the control unit PS 90 one can select a serial or an Ethernet interface. For the control units PS 30, PS 35 and PS 10 one can select a serial interface. In case of control units DC 500 and SMS 60 one can select a serial or a GPIB interface.

If the interface is defined, you can test it (**Connect** button). If it is connected, the message "Connection is OK" appears in the dialog status bar. Afterwards, the dialog box is closed. If the connecting attempt failed, the box will not be closed, and the message with the error code appears in the status bar. With the **Describe error** button the help file is loaded with the description of the error code. You also find this information in the appendix, page 84.
If you do not have any control unit, please select the type "demo", in order to test the program. The processes (actions) are carried out only virtually, no commands will be transferred to any controller. The logging of the interface communication is not possible. The hardware-specific features (joystick, keyboard, limit switches) are deactivated. The string "demo" stands in the controls instead of the values read out by the control unit.
For further information see chapter 3.1.

5.3 Configure axes

After connection of the various control units, you have to define the active axes. For each connected control unit a document window (control unit view) will be created in the main frame (area with OWIS® logos on a black background). The position and the size of this window can be changed (see above chapter "MDI application"). After having defined the active axes, this view displays the axis identifiers and the actual positions.
Only one of these document windows can be active at a certain time and also in the foreground. This is being indicated by the highlighted title bar. The control unit is selected (marked) now. You may continue defining the axes and the axis parameters for this control unit. The axes can be configured automatically or manually.

Clicking the icon (wizard mode) in the toolbar, or using the **Control Wizard mode** menu you can open the **Wizard for an axis configuration** dialog box. In this dialog box an axis configuration is possible for the selected control unit (the active window). Every axis can be prepared for the work (configured) step by step.
For further information see chapter 3.9.

5.3.1 Define axes

Using the wizard (step 1) or the **Control Define axis** menu you can open the **Define axes** dialog box, where you set the axis identifiers (for example, "A1", "x12", etc.) and activate the desired axes. An existing axis can be renamed here. Besides, the axis parameters are preserved.
Pressing the **OK** button you can activate the axes, save the axis definition and close the dialog box.

! Please note that with DC 500 and SMS 60 control units, it is important to use the existing hardware axes only, which have to be set active as well, otherwise mal-functioning may occur. With PS 90, PS 30, PS 35 and PS 10 the axes released in the control unit can be activated.

The control is axis-based. It means that when the control unit is connected and the axes are defined, each axis is only called with its identifier everywhere in the software.

! Note: Generally, the **File Control unit** and **Control** menus refer to the selected control unit.

For further information see chapter 3.3.

5.3.2 Set stage parameters and output format

After the axes have been defined, the axis parameters can be set.
Using the wizard (step 2) or the **Control Define positioning unit** menu you can open the **Define positioning unit** dialog box.
This dialog box enables you to define the positioning unit for the selected control unit. Additionally, you can define an output format for position and speed values, which will be used for each value output.

You can also decide which data are to be used for the control. If the data of the positioning unit are not known yet, the measuring unit “Inc” should be used for the position output, and “Hz” for the speed output. In this case the mechanical data, such as the spindle pitch, are irrelevant.
For further information see chapter 3.6.

5.3.3 Justify power supply

Next, you can check the motor power supply. Using the wizard (step 3) or the **Control Justify power supply** menu the **Justify power supply** dialog box appears. This box displays the parameters and the status of the power supply. The parameters which are grayed out are fix ones coming from the program database; they cannot be changed and are for information only. Control-relevant parameters can be changed and adapted to your special requirements.
The defined axes can be switched on automatically. This does not apply when an axis of the control unit has automatically been switched off due to a positioning error (PS 90, PS 30, PS 35, PS 10, DC 500: see control unit manual). In this case you can - using this dialog box - manually switch on this axis or re-connect the control unit.
For further information see chapter 3.7.

5.3.4 Set and test axis parameters and limit switch configuration

The specific axis parameters are displayed in the **Axis parameters** dialog box, which you can open with the wizard (step 4) or the **Control Axis parameters** menu. These are limit switch configurations, positioning speeds and acceleration values as well as PID feedback loop parameters or special parameters of the control unit (only for PS 90, PS 30, PS 35 and PS 10). They will be read out from the control unit. Here you can change and set these parameters individually or by groups.
The parameters will be separately defined for each control unit axis. After the selection the parameters are indicated for the suitable axis (controls are updated).

In order to simplify the setting you can select a suitable profile (configuration) from the program database. The selected data can be changed by means of the controls any time, if required or necessary.
With the **Set one parameter** button you can save the last changed parameter for the selected axis. With the **Set all parameters** button you can save all parameters for the selected axis. This is valid only for the selected tab. The limit switch configuration will be separately defined (see below).

During the parameter transfer the suitable values are sent to the control unit. Then the axis parameters are read out again and the controls are updated. Only the values assumed by the control unit are showed here. You can find the allowed value ranges for the parameters in the operating instructions of the control units. If the application has no connection with the control unit, the null value is showed in the controls.

With the **Save configuration** button you can save the limit switch configuration for the selected axis. During the parameter transfer the suitable values are sent to the control unit. Then the limit switch configuration and state are read out again and the controls are updated. Only the values assumed by the control unit are showed here.

You can test the adjusted axis parameters by means of reference run or short-distance. In order to do this you have to select the type of reference run or a certain distance. Afterwards, a reference or a test run can be executed.

In the dialog box you can update or delete existing profiles and create new ones. All changes are automatically transferred to the program database.

For further information see chapter 3.8.

5.4 Working with the software

5.4.1 Free positioning

After having connected the control units, defined the necessary axes and set the desired parameters, the preparatory phase is concluded. To create your first configuration may take a certain time. But once saved, this configuration can be restored, adapted, etc. Now you can dedicate yourself to your daily tasks. You can use five work areas.
You find a short summary of the information regarding the selected control unit in the **Info** dialog box (**Control Info** menu).
If the control unit is operated only through software, you can deactivate the control unit keyboard (DC 500, SMS 60). Click on the **Control Keyboard** menu in order to activate or deactivate the control unit keyboard. The keyboard is activated, if you see a check mark next to the command. If the menu item is grayed out, the control unit does not have a keyboard.
You can also redefine the path to the program database (file “owis.mdb”). In order to do this, please select the **Options Database** menu.
The language of the user interface can be selected in the **Options Sprache / Language** menu. Two languages (German and English) are available.

The **Free positioning** work area enables relative or absolute positioning to the defined positions. You can redefine current values of axis counters or home positions of the axes. Home positions can be driven to (absolute positioning mode). You can do all this with the selected axes only. A selection is made with the **active** check box.
The **Calibrate** function block permits to start the calibration or to measure the stage travel, as well as to change the calibration settings. The **Stop all** button stops the positioning, the calibration or the travel measurement.
You can reset a selected control unit to its initial state using the **Software reset** button.
This work area also enables to activate the joystick mode for the connected control units. In order to adapt the joystick configuration for the selected control unit, use the **Joystick control** dialog box (**Control Joystick configuration** menu).
For further information see chapter 4.1.

5.4.2 Meander

The **Meander** work area permits the execution of a meander-like movement with any 2 or 3 axes of the connected control units. Optionally, you have the possibility to stay for certain while or, when using the **Forward**, **Backward** buttons, to travel from one meander position to another. Reverse travel is also possible when using the **Change X Y Z- direction** option. When the **Activate joystick while meander is interrupted** option is active, you can click on the **Break meander** button in order to correct the present position by using the joystick.
Meander travel means that all coordinates of a two-dimensional pattern or of a three-dimensional grid are reached once. Two meander versions are available, “standard” and “unidirectional”. You find the description of both versions in the **Meander** work area (see chapter 4.2).
You can load and save the meander settings (configuration file with the extension “owm”).

5.4.3 Chain

The control elements in the **Chain** work area resemble those of the **Meander** work area. The chain function is a substantially extended, more universal version of the meander function. It enables to define and drive any coordinate sequences for all axes. Additionally, you can read positions using the joystick (so-called “teach-in”) and save them as table values.
Several comfortable editing functions are available, for example, marking of table cells with the mouse and then copying and pasting at the present cursor position into the table. You can also import data from an Excel file, using the same method.
You can load and save chain data (configuration file with the extension “owc”).
For further information please see chapter 4.3.

5.4.4 Program

The **Program** work area permits definition and execution of more complex motions than the **Meander** or **Chain** work areas. Loops and even computations are possible to a certain extent here. Using a program script you can extend the possibilities of **OWISoft** or automate certain operational sequences. It uses a small universal script language (applies to all control unit types). The script is generated in a text editor that can be found in the left section of the work area. The script language consists of 46 commands. Short command descriptions are to be found in the **Program** work area (see chapter 4.4).
If the program script has been generated, you can test (syntax check) or execute it. Optionally, you may execute the program or the test sequentially (line by line).
You can also load and save the program script (text file with the extension "owp").

5.4.5 Communication with the control unit (Auxiliary)

The **Auxiliary** work area enables the input of direct commands, if necessary with subsequent read-out of a possible answer, in accordance with the respective control unit manual for test purposes. It is possible to communicate directly with the motor control unit. The commands used for the corresponding control unit are described in the control unit's command reference. A read command normally begins with a question mark.
The communication is logged in a list box at the bottom of the work area.
For further information see chapter 4.5.

5.5 Activate and display the logging

For test purposes or in case of errors, the application offers the possibility of logging the interface communication. Clicking on the **Control Protocol file** menu command activates or deactivates the logging for the selected control unit. The contents of the log file can be displayed in the **Protocol** dialog box (**Control Protocol window** menu).

5.6 Save a control unit configuration

The control unit configuration can be stored anytime into an existing or a new configuration file (**File Control unit Save**, **File Control unit Save As** menus).
If the control unit view is closed, the connection will be closed, control unit axes stopped, and the interface closed. If desired, the parameters and the values of the interface configuration can be stored into the configuration file.

5.7 Close the application window

You can close the application window when clicking the **File Exit** menu command or the icon in the title bar.
If some configuration files (control units) are still open, you will be asked whether you want to save these.

6 Generating a sample configuration

This chapter defines a possible test configuration and describes in which order the corresponding settings are made.

Equipment

- 1x PS 90, RS-232 (9600 baud, handshake CR), 3-axis (3 active axes), LIMES 122 as axis 1, DMT 100 as axis 2 and LIMES 80 as axis 3.
- 1x PS 30, RS-232 (9600 baud, handshake CR), 3-axis (3 active axes), 3x LTM 80 as axis 1, 2 and 3.
- 1x PS 10, RS-232 (9600 baud, handshake CR), 1-axis (1 active axis), LIMES 80 as axis 1.

Setting the configuration

- PS 90: Click the icon “New control unit”. Click on the tab “RS-232”. Select the Com port “COM3”. Select the baud rate “9600”. Select handshake “CR”. Select “PS 90” under “Control unit type”. Click on “Connect”.
- PS 30: Click the icon “New control unit”. Click on the tab “RS-232”. Select the Com port “COM4”. Select the baud rate “9600”. Select handshake “CR”. Select “PS 30” under “Control unit type”. Click on “Connect”.
- PS 10: Click the icon “New control unit”. Click on the tab “RS-232”. Select the Com port “COM5”. Select the baud rate “9600”. Select handshake “CR”. Select “PS 10” under “Control unit type”. Click on “Connect”.

The views for the control unit in the program window have been defined during the initialization as follows: e.g. “PS90-1” = PS 90, “PS30-1” = PS 30, “PS10-1” = PS 10. Next, the active axes have to be defined.

- Axis definition PS 90: Select the third control unit (window “PS90-1”). Click on menu “Control Define axis”. Enter “a1” in the text box “Axis assignment 1”, “a2” in the text box “Axis assignment 2” and “a3” in the text box “Axis assignment 3”. Mark (checked) the check box “Control unit axis 1”, “Control unit axis 2” and “Control unit axis 3”. Click on “OK”.
- Axis definition PS 30: Select the second control unit (window “PS30-1”). Click on menu “Control Define axis”. Enter “x1” in the text box “Axis assignment 1”, “y1” in the text box “Axis assignment 2” and “z1” in the text box “Axis assignment 3”. Mark (checked) the check box “Control unit axis 1”, “Control unit axis 2” and “Control unit axis 3”. Click on “OK”.
- Axis definition PS 10: Select the third control unit (window “PS10-1”). Click on menu “Control Define axis”. Enter “x2” in the text box “Axis assignment 1”. Mark (checked) the check box “Control unit axis 1” and “Control unit axis 2”. Click on “OK”.

Now the axis identifiers for the 3 connected control units are defined as a1/a2/a3 (PS 90), x1/y1/z1 (PS 30) and x2 (PS 10). Afterwards the various axis parameters are to be set.

- Define positioning unit a1: Mark first control unit. Click on menu “Control Define positioning unit”. Select axis “a1”. Select positioning unit “LIMES122-50-HDS”. Define output format. Position: unit “mm”, number of digits “3”. Velocity: unit “mm/s”, number of digits “1”. Click on “Apply”.
- Define positioning unit a2: Select axis “a2”. Select positioning unit “DMT100-D53-HDS”. Define output format. Position: unit “deg” (degrees), number of digits “3”. Velocity: unit “deg/s” (degrees per second), number of digits “1”. Click on “Apply”.
- Define positioning unit a3: Select axis “a3”. Select positioning unit “LIMES80-50-HDS”. Define output format. Position: unit “mm”, number of digits “3”. Velocity: unit “mm/s”, number of digits “3”. Click on “Apply”.
- Define positioning unit x1: Mark second control unit. Click on menu “Control Define positioning unit”. Select axis “x1”. Select positioning unit “LTM80-75-HSM”. Define output format. Position: unit “mm”, number of digits “3”. Velocity: unit “mm/s”, number of digits “1”. Click on “Apply”.
- Define positioning unit y1: Select axis “y1”. Select positioning unit “LTM80-75-HSM”. Define output format. Position: unit “mm”, number of digits “3”. Velocity: unit “mm/s”, number of digits “1”. Click on “Apply”.

- Define positioning unit z1: Select axis “z1”. Select positioning unit “LTM80-75-HSM”. Define output format. Position: unit “Inc” (increments), number of digits “0”. Velocity: unit “Hz”, number of digits “0”. Click on “Apply”.
- Define positioning unit x2: Mark third control unit. Click on menu “Control Define positioning unit”. Select axis “x2”. Select positioning unit “LIMES80-50-HSM”. Define output format. Position: unit “Inc” (increments), number of digits “0”. Velocity: unit “Hz”, number of digits “0”. Click on “Apply”.

Now you have the following settings:

Control unit	PS 90			PS 30			PS 10
Name	PS90-1			PS30-1			PS10-1
Axis no.	1	2	3	1	2	3	1
Axis identifier	a1	a2	a3	x1	y1	z1	x2
Positioning unit	LIMES 122	DMT 100	LIMES 80	LTM 80	LTM 80	LTM 80	LIMES 80
Position: Unit	mm	deg	mm	mm	mm	increments	increments
Position: Digits	3	3	3	3	3	0	0
Velocity: Unit	mm/s	deg/s	mm/s	mm/s	mm/s	Hz	Hz
Velocity: Digits	1	1	3	1	1	0	0

In order to complete the setting, please check whether the values indicated here correspond to those having been pre-set in the control unit. The desired positioning velocity can also be set here. In order to be able to use the pre-set values again, profiles are to be defined and saved for all seven axes.

Test values for positioning velocity:

Control unit	PS 90			PS 30			PS 10
Name	PS90-1			PS30-1			PS10-1
Axis no.	1	2	3	1	2	3	1
Axis identifier	a1	a2	x1	y1	z1	z1	x2
Positioning unit	LIMES 122	DMT 100	LIMES 80	LTM 80	LTM 80	LTM 80	LIMES 80
Velocity	5 mm/s	15 deg/s	5 mm/s	6 mm/s	5 mm/s	50000 Hz	50000 Hz

- Setting axis profile PS 90, axis 1. Mark third control unit. Click on menu “Control Profile...”. Select axis “a1”. Enter the desired velocity “5” (mm/s) and click on “Set one parameter”. Click on “Create new profile”. Enter profile name “PS90_LIMES122-50-HDS_5mm/s**”** and click on “Apply”.
- Setting axis profile PS 90, axis 2: Select axis “a2”. Enter the desired velocity “15” (deg/s) and click on “Set one parameter”. Click on “Create new profile”. Enter profile name “PS90_DMT100-D53-HDS_15deg/s” and click on “Apply”.
- Setting axis profile PS 90, axis 3. Select axis “a3”. Enter the desired velocity “5” (mm/s) and click on “Set one parameter”. Click on “Create new profile”. Enter profile name “PS90_LIMES80-50-HDS_5mm/s” and click on “Apply”.
- Setting axis profile PS 30, axis 1: Mark second control unit. Click on menu “Control Profile...”. Select axis “x1”. Enter the desired velocity “6” (mm/s) and click on “Set one parameter”. Click on “Create new profile”. Enter profile name “PS30_LTM80-75-HSM_6mm/s” and click on “Apply”.
- Setting axis profile PS 30, axis 2: Select axis “y1”. Enter the desired velocity “5” (mm/s) and click on “Set one parameter”. Click on “Create new profile”. Enter profile name “PS30_LTM80-75-HSM_5mm/s” and click on “Apply”.
- Setting axis profile PS 30, axis 3: Select axis “z1”. Enter the desired velocity “50000” (Hz) and click on “Set one parameter”. Click on “Create new profile”. Enter profile name “PS30 LTM80-75-HSM_50000Hz” and click on “Apply”.
- Setting axis profile PS 10, axis 1. Mark third control unit. Click on menu “Control Profile...”. Select axis “x2”. Enter the desired velocity “50000” (Hz) and click on “Set one parameter”. Click on “Create new profile”. Enter profile name “PS10_LIMES80-50-HSM_50000Hz” and click on “Apply”.

Appendix

DC 500 error handling

1. **Initialization error** (function DC500_InitInterface).
The returned value is the error code.

- 0 – no error
- 1 – function error (invalid control unit number)
- 2 – invalid interface (0 – serial interface, 1 – GPIB interface)

COM

- 3 – invalid serial (COM) port
- 4 – wrong baud rate
- 5 – no response from control unit (check cable, connection or reset control unit)
- 6 – invalid combination of the interface parameters

GPIB

- 101 – file “Gpib-32.dll” not found
- 102 – non-existent GPIB board or it is not addressed correctly
- 103 – invalid interface values
- 104 – control unit does not answer (check cable, connection or reset control unit)
- 105 – no listeners on the GPIB
- 106 – invalid handshake character

2. **Function error** (all other functions).
With the write functions (DC500_Set...) the error code is defined as return value.
With the read functions (DC500_Get...) the error code is stored as a variable. You can read the variable value with the function DC500_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

- 0 – no error
- -1 – function error (invalid control unit or axis number)
- -2 – communication error (communication control unit <--> PC)
- -3 – syntax error (control unit)

Function DC500_SetDEC

- -4 – file not found
- -5 – loaded file is not an OWIS® file (*.oct)
- -6 – stage data (serial number) is invalid
- -7 – none or wrong data has been loaded

3. **GPIB error** (visible only in protocol).
Function error =-2. There are 18 errors. The most important as follows:

EDVR(0) ---> 102
ENOL(2) ---> 105
EADR(3)
EARG(4) ---> 103
EABO(6)
ENEB(7) ---> 102
EBUS(8) ---> 104
ESTB(15)

SMS 60 error handling

1. **Initialization error** (function SMS60_InitInterface).
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)
2 – invalid interface (0 – serial interface, 1 – GPIB interface)

COM

3 – invalid serial (COM) port
4 – wrong baud rate
5 – control unit does not answer (check cable, connection or reset control unit)
6 – invalid combination of the interface parameters

GPIB

101 – file “Gpib-32.dll” not found
102 – non-existent GPIB board or it is not addressed correctly
103 – invalid interface values
104 – no response from control unit (check cable, connection or reset control unit)
105 – no listeners on the GPIB
106 – invalid handshake character

2. **Function error** (all other functions).
With the write functions (SMS60_Set...) the error code is defined as return value.
With the read functions (SMS60_Get...) the error code is stored as a variable. You can read the variable value with the function SMS60_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

0 – no error
-1 – function error (invalid control unit or axis number)
-2 – communication error (communication control unit <--> PC)
-3 – syntax error (control unit)

Function SMS60_SetDEC

-4 – file not found
-5 – loaded file is not an OWIS® file (*.oct)
-6 – stage data (serial number) is invalid
-7 – none or wrong data has been loaded

3. **GPIB error** (visible only in protocol).
Function error =-2. There are 18 errors. The most important as follows:

EDVR(0) ---> 102
ENOL(2) ---> 105
EADR(3)
EARG(4) ---> 103
EABO(6)
ENEB(7) ---> 102
EBUS(8) ---> 104
ESTB(15)

PS 90 error handling

1. **Initialization error**.
1.1 Function PS90_Connect.
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)
2 – invalid interface (0 – USB or serial interface, 1 – NET interface)

COM
3 – invalid serial (COM) port
4 – invalid combination of the interface parameters
5 – no response from control unit (check cable, connection or reset control unit)
6 – baud rate has changed, reconnect control unit

NET
8 – no connection to Modbus/TCP, check settings

1.2 Function PS90_SimpleConnect.
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)

COM
7 – control unit with the specified serial number is not found

2. **Function error** (all other functions).
With the write functions (PS90_Set...) the error code is defined as return value.
With the read functions (PS90_Get...) the error code is stored as a variable. You can read the variable value with the function PS90_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

0 – no error
-1 – function error (invalid control unit or axis number)
-2 – communication error (communication control unit <--> PC)
-3 – syntax error (control unit)
-4 – axis in wrong state (control unit)

Function PS90_SetDEC

-5 – file not found
-6 – loaded file is not an OWIS® file (*.oct)
-7 – stage data (serial number) is invalid
-8 – none or wrong data has been loaded

Function PS90_GetOWISidData (read OWISid data)

-9 – error, OWISid chip is not found
-10 – error, OWISid parameter is empty (not defined)

PS 30 error handling

1. **Initialization error**.
1.1 Function PS30_Connect.
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)
2 – invalid interface (0 – virtual serial interface)
3 – invalid serial (COM) port
4 – invalid combination of the interface parameters
5 – no response from control unit (check cable, connection or reset control unit)
6 – baud rate has changed, reconnect control unit

1.2 Function PS30_SimpleConnect.
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)
7 – control unit with the specified serial number is not found

2. **Function error** (all other functions).
With the write functions (PS30_Set...) the error code is defined as return value.
With the read functions (PS30_Get...) the error code is stored as a variable. You can read the variable value with the function PS30_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

0 – no error
-1 – function error (invalid control unit or axis number)
-2 – communication error (communication control unit <--> PC)
-3 – syntax error (control unit)
-4 – axis in wrong state (control unit)

Function PS30_SetDEC

-5 – file not found
-6 – loaded file is not an OWIS® file (*.oct)
-7 – stage data (serial number) is invalid
-8 – none or wrong data has been loaded

Function PS30_GetOWISidData (read OWISid data)

-9 – error, OWISid chip is not found
-10 – error, OWISid parameter is empty (not defined)

PS 35 error handling

1. **Initialization error**.
1.1 Function PS35_Connect.
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)
2 – invalid interface (0 – USB or serial interface)
3 – invalid serial (COM) port
4 – invalid combination of the interface parameters
5 – no response from control unit (check cable, connection or reset control unit)
6 – baud rate has changed, reconnect control unit

1.2 Function PS35_SimpleConnect.
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)
7 – control unit with the specified serial number is not found

2. **Function error** (all other functions).
With the write functions (PS35_Set...) the error code is defined as return value.
With the read functions (PS35_Get...) the error code is stored as a variable. You can read the variable value with the function PS35_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

0 – no error
-1 – function error (invalid control unit or axis number)
-2 – communication error (communication control unit <--> PC)
-3 – syntax error (control unit)
-4 – axis in wrong state (control unit)

Function PS35_SetDEC

-5 – file not found
-6 – loaded file is not an OWIS® file (*.oct)
-7 – stage data (serial number) is invalid
-8 – none or wrong data has been loaded

Function PS35_GetOWISidData (read OWISid data)

-9 – error, OWISid chip is not found
-10 – error, OWISid parameter is empty (not defined)

PS 10 error handling

1. **Initialization error**.
1.1 Function PS10_Connect.
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)
2 – invalid interface (0 – virtual serial interface)
3 – invalid serial (COM) port
4 – invalid combination of the interface parameters
5 – no response from control unit (check cable, connection or reset control unit)
6 – baud rate has changed, reconnect control unit

1.2 Function PS10_SimpleConnect.
The returned value is the error code.

0 – no error
1 – function error (invalid control unit number)
7 – control unit with the specified serial number is not found

2. **Function error** (all other functions).
With the write functions (PS10_Set...) the error code is defined as return value.
With the read functions (PS10_Get...) the error code is stored as a variable. You can read the variable value with the function PS10_GetReadError. The value is not buffered. It will be overwritten when using the next read function. In case of an error, the read function returns the zero value.

0 – no error
-1 – function error (invalid control unit or axis number)
-2 – communication error (communication control unit <--> PC)
-3 – syntax error (control unit)
-4 – axis in wrong state (control unit)

Function PS10_SetDEC

-5 – file not found
-6 – loaded file is not an OWIS® file (*.oct)
-7 – stage data (serial number) is invalid
-8 – none or wrong data has been loaded

Function PS10_GetOWISidData (read OWISid data)

-9 – error, OWISid chip is not found
-10 – error, OWISid parameter is empty (not defined)

Figures

Figure 1. Starting the application

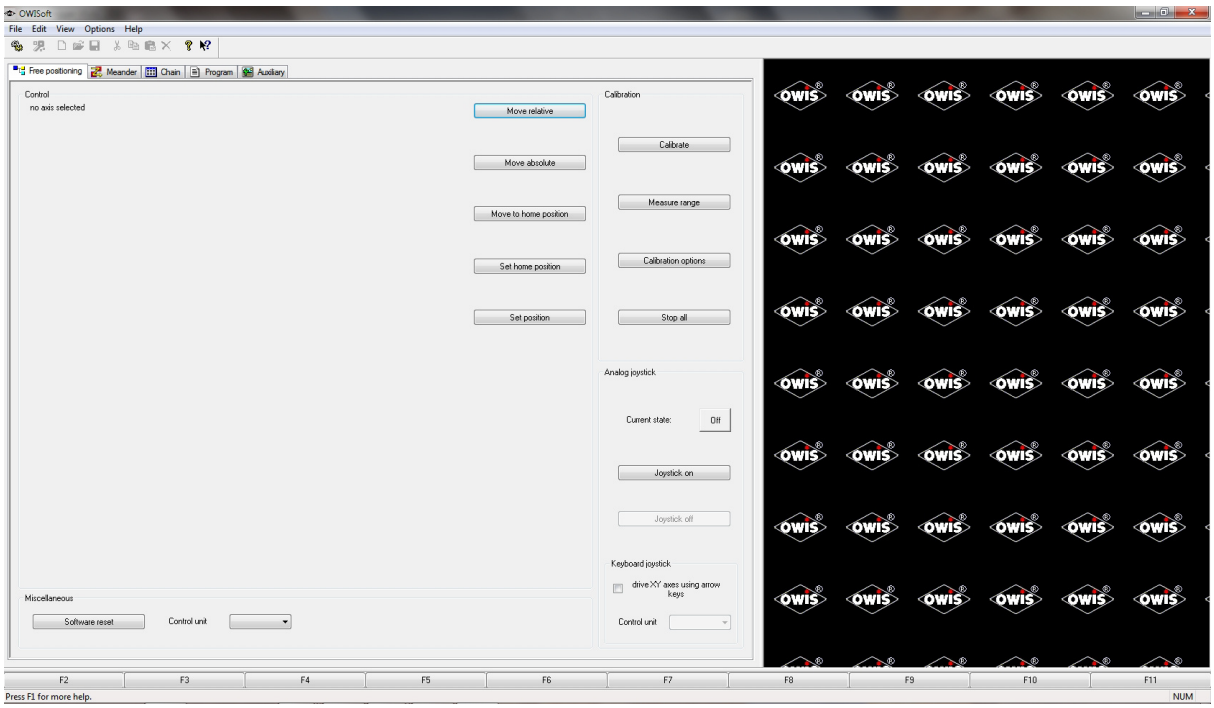


Figure 2. Free positioning work area

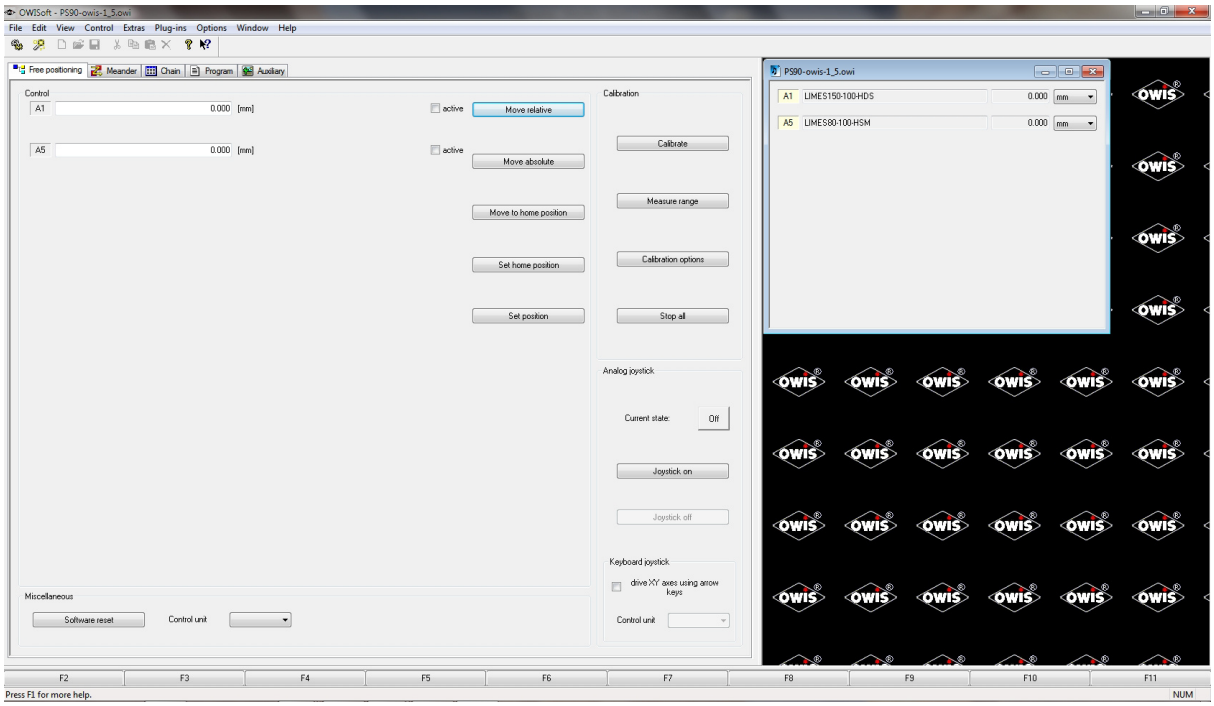


Figure 3. Meander work area

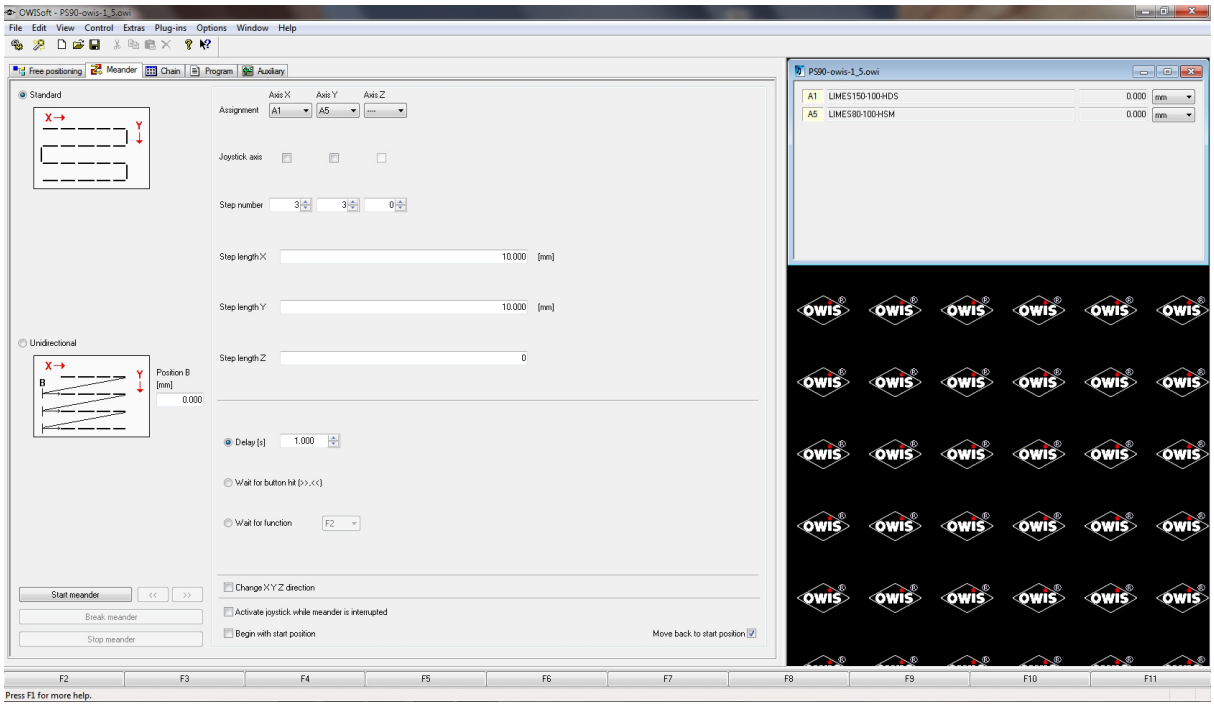


Figure 4. Chain work area

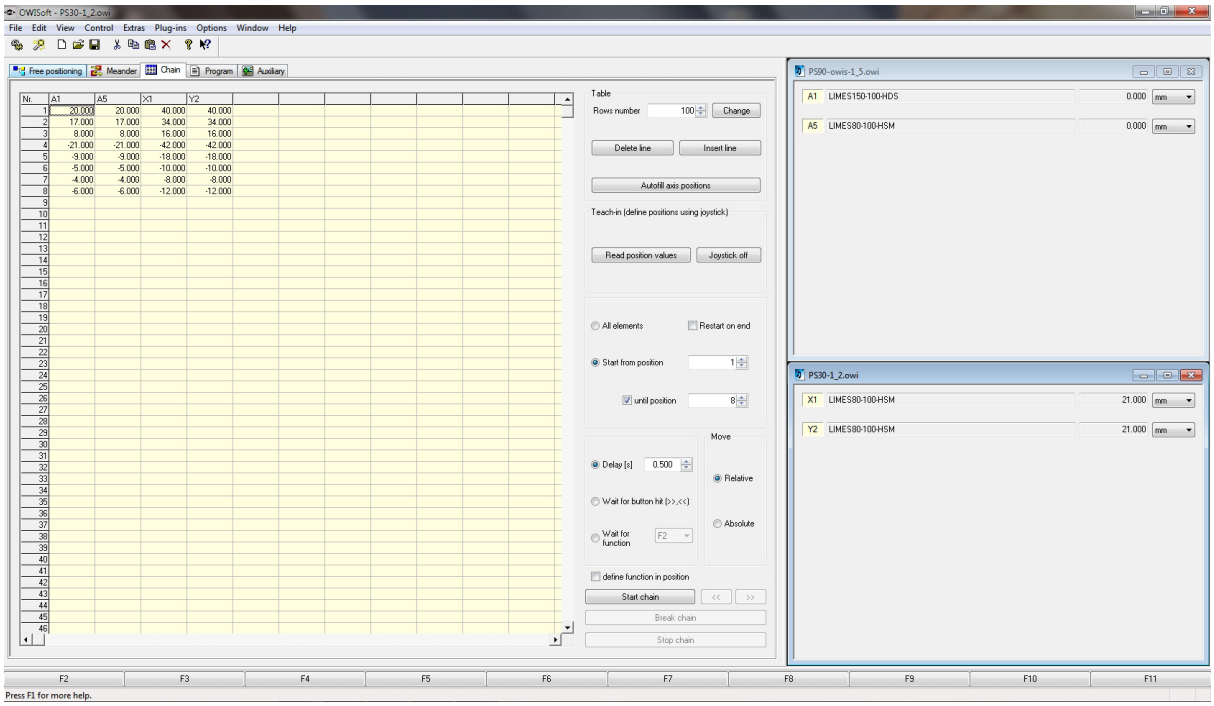


Figure 5. Program work area

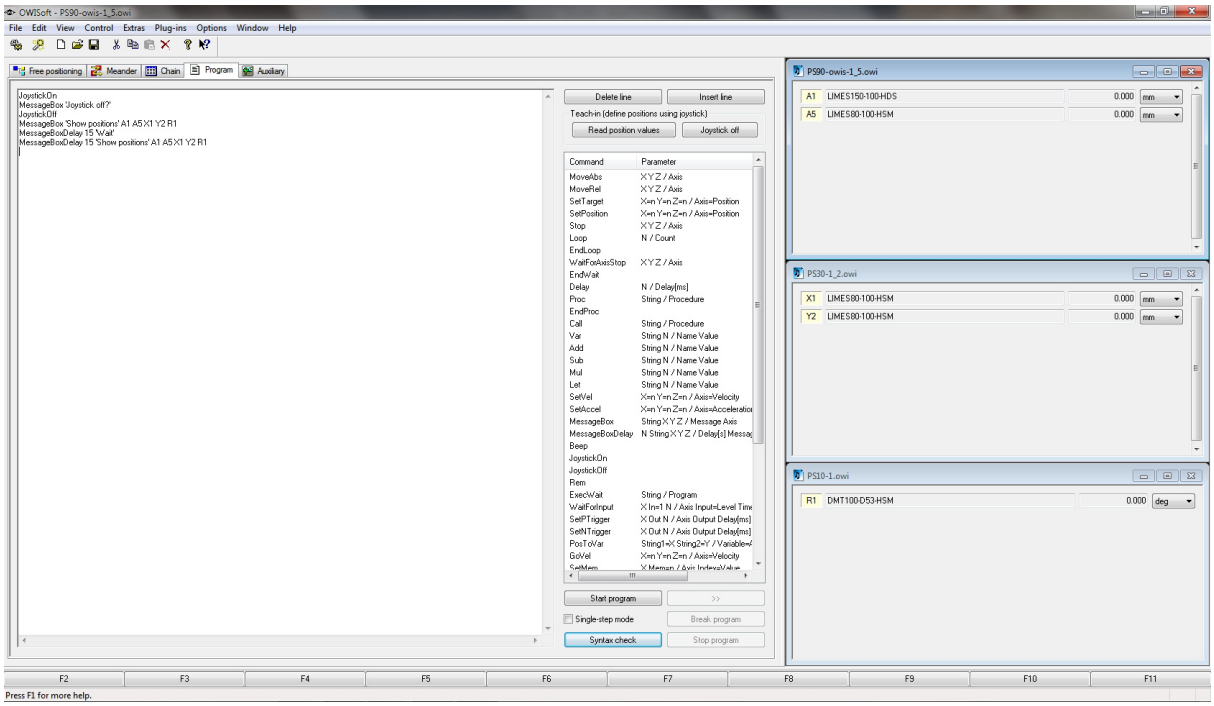

OWISoft - PS90-owis-1_5.owi
File Edit View Control Extras Plug-ins Options Window Help
Free positioning Meander Chain Program Auxiliary
JoystickOn
MessageBox 'Joystick off?'
JoystickOff
MessageBox 'Show positions' A1 A5 X1 Y2 R1
MessageBoxDelay 15 'Wait'
MessageBoxDelay 15 'Show positions' A1 A5 X1 Y2 R1
Delete line
Insert line
Teach-in (define positions using joystick)
Read position values
Joystick off
Command
Parameter
MoveAbs X Y Z / Axis
MoveRel X Y Z / Axis
SetTarget X=n Y=n Z=n / Axis=Position
SetPosition X=n Y=n Z=n / Axis=Position
Stop X Y Z / Axis
Loop N / Count
EndLoop
WaitForAxisStop X Y Z / Axis
EndWait
Delay N / Delay[ms]
Proc String / Procedure
EndProc
Call String / Procedure
Var String N / Name Value
Add String N / Name Value
Sub String N / Name Value
Mul String N / Name Value
Let String N / Name Value
SetVel X=n Y=n Z=n / Axis=Velocity
SetAccel X=n Y=n Z=n / Axis=Acceleration
MessageBox String X Y Z / Message Axis
MessageBoxDelay N String X Y Z / Delay[s] Messa
Beep
JoystickOn
JoystickOff
Rem
ExecWait String / Program
WaitForInput X In=1 N / Axis Input=Level Time
SetPTrigger X Out N / Axis Output Delay[ms]
SetNTrigger X Out N / Axis Output Delay[ms]
PosToVar String1=X String2=Y / Variable=
GoVel X=n Y=n Z=n / Axis=Velocity
Start program
Single-step mode
Break program
Syntax check
Stop program
PS90-owis-1_5.owi
A1 LIMES150-100-HDS 0.000 mm
A5 LIMES80-100-HSM 0.000 mm
PS30-1_2.owi
X1 LIMES80-100-HSM 0.000 mm
Y2 LIMES80-100-HSM 0.000 mm
PS10-1.owi
R1 DMT100-D53-HSM 0.000 deg
F2 F3 F4 F5 F6 F7 F8 F9 F10 F11
Press F1 for more help.

Figure 6. Program work area (program script is executed)

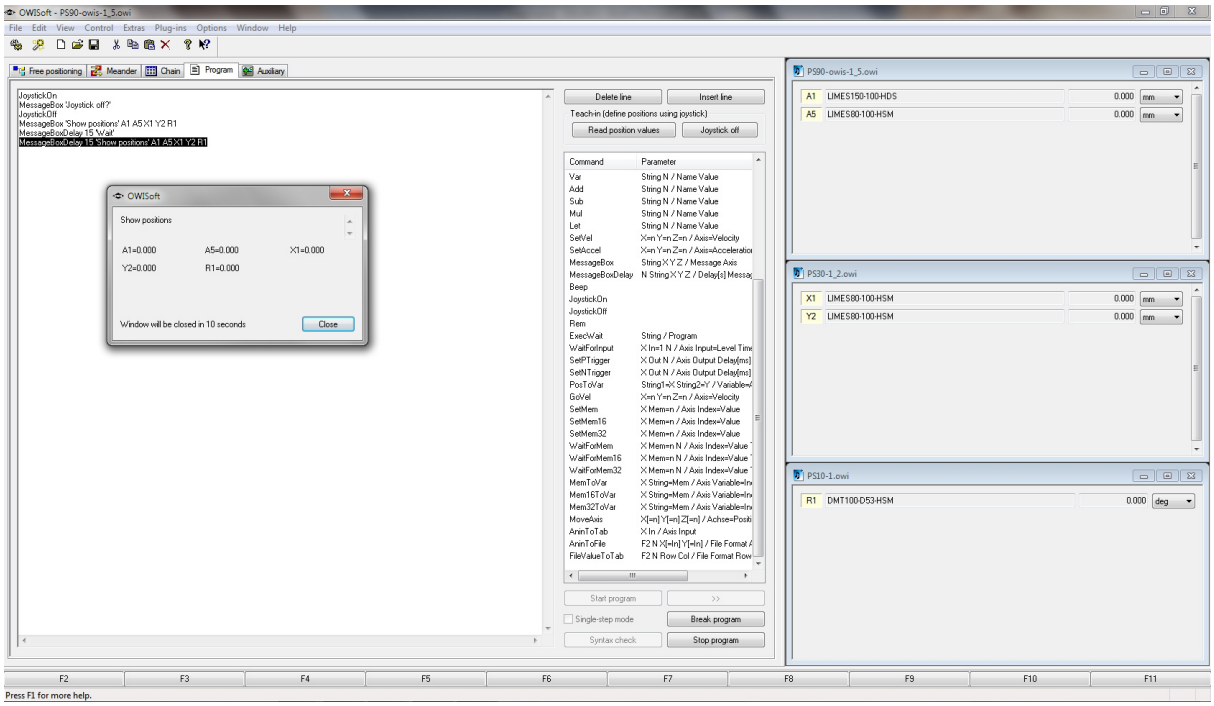


Figure 7. Auxiliary work area